THE JEWELLERS' GUIDE

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REDMAN

THE JEWELLER'S GUIDE AND HANDY REFERENCE BOOK.

NEW EDITION

BY

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PREFACE.

In compiling the following work, it has been our aim to give real and useful information in as little space as possible. We find that comparatively little is known as to the true value of gold and silver articles, and their marks, &c., though persons of wealth having an inclination for precious stones and jewellery, may, with a little discretion, get supplied at reasonable prices from their respective jewellers, now that competition is so keen. In this, as in all other branches of business, the best article will be found the most satisfactory in the end, to both the dealer and the wearer.

For the kind assistance rendered in the collection of the matter for this brief work, the author gladly acknowledges his obligation to Mr Robinson, of the Goldsmith's Company, and the Assay Masters of every provincial Goldsmith's Hall; also to the following gentlemen who have kindly given consent for extracts to be inserted from their valuable copyright works :—to Messrs. W. & R. Chambers, Edinburgh; Mr E. W. Streeter, F.R.G.S., Bond Street, London, author of "Precious Stones and Gems;" to Mr W. J. Cripps, M.A., F.S.A., London, author of "Old English Plate,"

its makers and marks, published by Mr Murray; and to Mr George E. Gee, Birmingham, author of "The Goldsmith's Handbook," and "The Silversmith's Handbook."

The question of Hall-Marking will be more appreciated by all classes, the more it is understood, because the public are better satisfied when they know a thing is real, and will gladly pay more than the difference in cost. We find that Hall-Marked goods are becoming more and more in demand; it would be a great mistake to abolish the Hall-mark, but a more simple and uniform system throughout the United Kingdom is desirable; also the practice of foreign watch-cases being sent to England to be marked, and then returned and sold as English-made watches, with cheap foreign movements in, is a system which undoubtedly places the English watchmakers at a disadvantage, and ought to be altered.

The lists of Date Letters will be found useful and interesting, and Mr Cripps' valuable work, and other works on this subject, will, in future, be more than ever esteemed. We trust the treaties on diamonds will be found satisfactory, considering the size and price of the book. Mr Streeter's work on "Precious Stones and Gems" is a masterpiece, and ought to be read by all in the trade. "The Goldsmith's Handbook," published by Crosby, Lockwood & Co., Ludgate Hill, and "The Hall-Marking of Jewellery" by the same author, G. E. Gee, Esq., are two capital works.

In conclusion, the compiler of this work, will be glad to be informed of any errors which may have been

overlooked, (for though no pains have been spared to make it as accurate as possible, the nature of the work renders it extremely difficult to attain absolute accuracy in every detail,) so that in the event of a future edition, they may be rectified.

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DIAMONDS.

DIAMOND (corrupted from Gr. *adamant*, untamable, refractory), the most highly valued of precious stones, and the hardest of all known substances. It consists of Carbon (q.v.), a simple or elementary substance, crystallised, and in its greatest purity. Diamonds are commonly colourless and clear like water; although sometimes, from some slight foreign intermixture, they are white, gray, yellow, green, brown, and more rarely orange, red, blue or black. The lustre is adamantine and very high; the transparency perfect in specimens perfectly free from foreign substances, the presence of which, however, even in very small quantity, mars it, and sometimes almost produces opacity. The D. becomes positively electric by friction, but is not electrified by heat, a test which sometimes serves to distinguish it from the topaz. Its specific gravity is about 3·6. Its primary form is a regular octahedron, but it appears also in rhombic dodecahedrons; and its crystals often have curvilinear faces and edges. Its structure is distinctly lamellar. It burns before the

blow-pipe in air or in oxygen gas, combining with oxygen to form carbonic acid. Its hardness renders it incapable of being scratched by any other substance, and in cutting and polishing diamonds, diamond-dust is employed. The estimation in which it is held as a precious stone is due to its remarkable hardness, rarity, and brilliancy. The art of cutting diamonds, although long practised in India and China, was not known in Europe till after the middle of the 15th c., when it was discovered by Louis van Berguen of Bruges. Previous to that time, diamonds were set without being cut, and in that state they have often a rough, dull, and uneven surface. Diamonds are indeed found not only in the form of perfect crystals, but also in rolled grains; and they are obtained partly from alluvial soils and the sands of rivers, and partly from rocks, chiefly a quartzy sandstone or conglomerate, in which they are often associated with gold. A number of localities in India have long been celebrated as productive of diamonds, particularly Golconda (q.v.); they are found also in Malacca, Borneo, and other parts of the East; nor were any diamonds procured in any other part of the world till the beginning of the 18th c., when they were discovered in remarkable abundance in the district of Serra du Frio, in the province of Minas Geraes in Brazil. Previous to that time, diamonds fonnd in Brazilian gold mines had deen disregarded as mere pebbles; their nature became known in consequence of some of them accidentally finding their way to Europe. In 1829, they were discovered in the Ural Mountains. They have also been found in Rutherford

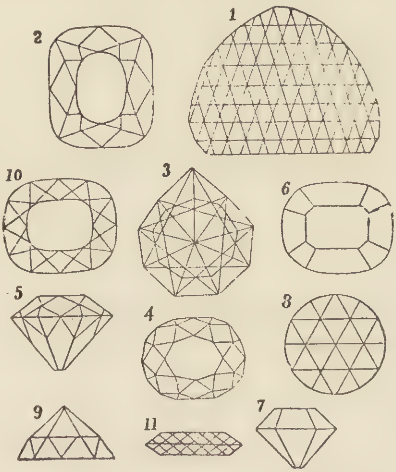
County, North Carolina ; in Hale county, Georgia ; in the province of Constantine, Algeria ; and in Australia. Diamond mines consist in general of mere diggings and washings of alluvial deposits. In Brazil, the method pursued is to rake the alluvial matter backwards and forwards on inclined planes, over which a stream of water is made to run, till the lighter particles are carried away, when large stones are picked out by the hand, and what remains is carefully examined for diamonds. The work is carried on by slaves, and when a diamond of seventeen carats is found, the slave who finds it is entitled to his liberty, Large diamonds are comparatively rare among those of Brazil, all the notable diamonds in the world being Indian. Brazil produces yearly from 25,000 to 30,000 carats of diamonds of which, however, not more than 9000 carats are capable of being cut, the rest being either very small or of inferior quality. The small and inferior diamonds are called Bort, and command a ready sale for their use in the arts, being pounded in a steel mortar, and much employed in the form of diamond-dust by lapidaries for cutting and polishing diamonds and all kinds of gems, and even for polishing rock-crystals for spectacles. Minute fragments or splinters of bort are also used for making fine drills, which are used for drilling small holes in rubies and other hard stones to be employed in watch-making, gold and silver wire-drawing, &c., and for piercing holes for rivets in China, in artificial enamel teeth, &c. The use of small diamonds by glaziers for cutting glass is well known. The diamonds so used are uncut, and they are so

mounted as to act upon the glass not by an angle, but by a curvilinear edge of the crystal. The cut is only to the depth of about one two-hundredth part of an inch, but is sufficient to make the glass readily break in accordance with it.

Diamonds are cut into various forms, but principally into *brilliants* and *rose diamonds.* The *brilliant* cut is the most expensive and difficult, but is also that which best brings out the beauty of the stone: it has an upper or principal octagonal face, surrounded with many facets, and other things being equal, the greater the number of facets the more valuable is the diamond. The lapidaries of the East, however, sometimes multiply facets to hide imperfections of the stone. *Rose diamonds* have a flat base, above which are two rows of triangular facets, the six uppermost uniting in a point. Rose diamonds are made of those stones which are too broad in proportion to their depth to be cut as brilliants. Stones still thinner are cut as *table diamonds.* The art of sawing diamonds, when too thick in proportion to their surface, was invented by a Dutchman named Dalbeck, in the beginning of the 19th century.

The value of diamonds is variously estimated. The rule generally given is to square the number of carats the diamond weighs, and then to multiply by the price of a single carat. Thus, a rough diamond of 12 carats weight, one carat being estimated at £2, would cost $12 \times 12 \times 2 = £288$. The value of a diamond is much increased by its being cut, although the actual weight is diminished. Beyond a certain weight, no rule of calcu-

lation can be applied, owing to the limited number of purchasers, and the most fabulous values have been assigned to famous diamonds. The price of diamonds is now less than it once was.



Diamond :

1, the Koh-i-noor; 2, Regent or Pitt Diamond; 3, Grand Duke; 4, 5, vertical and lateral appearance of the brilliant diamond; 6, 7, vertical and lateral appearance of the brilliant diamond before being recut; 8, 9, vertical and lateral appearance of rose-cut diamond; 10, 11, the table cut diamond.

There is a way of falsifying diamonds by joining an under part of some other stone to an upper part of genuine diamond. Some varieties of Sapphire, Hyacinth, and Topaz, are often passed off for diamonds. The first two may be distinguished by their greater specific gravity, the latter by its becoming electric when heated. Rock-crystal, and glass or 'paste' imitations, are lighter than true diamonds, and less hard and

brilliant. The best test of a genuine diamond is hardness. Care must be taken, however, to avoid breaking off its angles, in attempting to test it by scratching other substances with it, as, notwithstanding its hardness, it is somewhat brittle.

Some particular diamonds, from their unusual magnitude, or from circumstances of their history, are of such interest as to entitle them to notice. The collection of the emperor of Brazil is said to contain an uncut diamond—the Braganza diamond—of the enormous weight of 1680 carats, or about 12 ounces; but it is suspected to be only a fine colouress topaz.—The largest diamond certainly known is that belonging to the rajah of Mattan, weighing 367 carats. It is egg-shaped, with an indented hollow near the smaller end. Many years ago, the governor of Borneo offered for it 500,000 dollars, two war-brigs fully equipped, a number of cannon, and a quantity of powder and shot. But the rajah refused to part with it, the fortunes of his family being supposed to be connected with it, and the Malays ascribing to water in which it has been dipped the power of healing all diseases. Next to this diamond in size, ranks the celebrated Koh-i-noor (q.v.), once a boasted possession of the Great Mogul, and now belonging to the Queen of Great Britain. It weighs 279 carats; but is said to have weighed in the rough state 900 carats.—The Orlow diamond, belonging to the Russian emperor, and which was once the eye of an Indian idol, is said to have weighed, when rough, 779 carats, but is now cut, egg-shaped, and weighs 195 carats.—The Regent diamond, or Pitt diamond, which

weighs in its cut state 136¾ carats, is unrivalled in its limpidness and its form, its diameter and depth being nearly equal. It was found in Golconda, was brought from India by an English gentleman named Pitt, the grandfather of the first Earl of Chatham, and by him sold to the Duke of Orleans for £130,000. It decorated the hilt of the sword of state of the first Napoleon, was taken by the Prussians at Waterloo, and now belongs to the king of Prussia.—The Sanci diamond, weighing 106 carats, has a still more interesting history. It belonged to Charles the Bold, Duke of Burgundy, who wore it in his hat, at the battle of Nancy, where he fell. A Swiss soldier found it, and sold it to a clergyman for a gulden. It passed into the possession of Anton, King of Portugal, who was obliged to sell it, the price being 100,000 francs; and it shortly afterwards became the property of a French gentleman named Sanci, whose descendant being sent as ambassador to Soleure, King Henry III. required the diamond as a pledge; but the servant who was carrying it to the King was attacked by robbers on the way and murdered, not, however, till he had swallowed the diamond. His master, fully confident of his faithfulness, caused his body to be opened, and found it in his stomach. This diamond came into the possession of the crown of England, and James II. carried it with him to France in 1688. Louis XV. wore it at his coronation. In 1835, it was purchased by a Russian nobleman for half a million rubles (80,000). The Sanci diamond is said to have been the first diamond which was cut in Europe.

EMERALDS.

EMERALD (Sp. *esmeralda*, Fr. *émeraude*, Ger. *smaragd*, Gr. *smaragdos;* the name is originally Semitic, or at least eastern, but the signification is unknown), a mineral generally regarded by mineralogists as merely another variety of the same species with the Beryl (q.v.), with which it essentially agrees in composition, crystallisation, &c., differing in almost nothing but colour. The E., which, as a gem, is very highly valued owes its value chiefly to its extremely beautiful velvety green colour. It is composed of about 67—68 per cent. of silica, 15—18 of alumina, 12—14 of glucina, and a very little peroxide of iron, lime, and oxide of chromium. Its colour is ascribed chiefly to the oxide of chromium which it contains. Its specific gravity is 2·577—2·725. In hardness it is rather inferior to topaz. The localities in which E. is found are very few. The finest have long been brought from South America, where they are obtained from veins traversing clay-slate, hornblende slate, and granite, in a valley not far from Santa Fê de Bogoto. Emeralds of inferior quality are found in Europe, embedded in mica-slate in the Henbach Valley in Salzburg. They are also found in the Ural; and some old mines in Upper Egypt have also been discovered to yield them, from which, probably, the ancients obtained them. This gem, known from very early times, was highly prized by the ancients. Pliny states that when Lucullus landed at Alexandria, Ptolemy offered him an E. set in gold, with his portrait engraven on it. Many wrought emeralds

have been found in the ruins of Thebes. Nero, who was near-sighted, looked at the combats of gladiators through an eye-glass of E., and concave eye-glasses of E. seems to have been particularly esteemed among the ancients. As a precious stone, the E. is rarely without flaw. Its value also depends much on its colour. A very perfect E. of six carats has been sold for £1,000.

It appears not improbable that emeralds have been found in the East, in localities not at present known, but the name E. or ORIENTAL E. is often given to a very rare, beautiful, and precious green variety of SAPPHIRE (q.v.).

E. COPPER is a beautiful and very rare E. Green crystallised mineral, also called DIOPTASE, found only in the Kirghis Steppe, and composed of about 39 parts silica, 50 protoxide of copper, and 11 water.

GOLD.

GOLD (symbol Au, atomic weight 99·6) has been known and regarded as the most precious of the metals from the earliest ages of the world, and has been universally employed as a medium of exchange. Although the quantity of G. which is found, when compared with that of many other metals, is small, yet there are few parts of the globe in which it does not occur more or less abundantly.

In the native state, it occurs crystallised, the primary form being the cube, or in plates, ramifications, or or nodules—popularly known as *nuggets*—which sometimes are of very considerable size. It is almost always alloyed with silver, and sometimes with tellurium, bismuth, lead, &c. It sometimes occurs in small quantity in metallic sulphides, as in galena, iron and copper pyrites.

The extraction of G. from the substances with which it is associated is effected more by mechanical than chemical means. See below.

The following are its most important properties. In its compact state, it possesses a characteristic yellow colour and high metallic lustre, is nearly as soft as lead, and is the most malleable of all metals. It can be beaten into leaves of a thinness not exceeding $\frac{1}{200000}$, or, according to some authors, $\frac{1}{280000}$ of an inch, through which light passes with a green tint; one grain may thus be distributed over 56 square inches of surface; and the ductility of the metal is so great, that the same quantity may be drawn out into 500 feet of wire. In its tenacity, it is inferior to iron, platinum, copper, and silver; but a wire whose diameter is 0·787 (or rather more than one-third) of a line (which is one-twelfth of an inch), will support a weight of about 150 lbs. It fuses at about 2016 degrees, according to Daniell's pyrometer, and when in fusion, is of a bluish-green colour. It is scarcely at all volatile in the heat of the furnace, but by a powerful electric discharge, by the concentration of the sun's rays by a powerful burning-glass, or by the oxy-hydrogen jet, it is dispersed in

purple vapours. G. has very little affinity for oxygen; it undergoes no change on exposure to the atmosphere, and is unaffected by hydrochloric, sulphuric, or nitric acid, or, in short, by any simple acid except selenic acid; nor do the alkalies affect it. It is, however, dissolved by any mixture which liberates chlorine, its usual solvent being *aqua regia*, which is generally prepared by mixing 1 part of nitric acid with 4 parts of hydro-chloric acid. Hydrochloric acid to which binoxide of manganese has been added, acts equally well, the G. in these cases being converted into a chloride. This metal is one of the most perfect conductors both of heat and of electricity. When precipitated in a finely comminuted state, it is of a brown colour; but when suspended in water, and viewed by transmitted light, it appears purple. The specific gravity of this metal is less than that of platinum and iridium, ranging from 19·2 to 19·4, according as it is fused or hammered.

The alloys of G., or its combinations with other metals, are very numerous, those with copper and mercury being the most important. Copper and G. combine in all proportions without materially affecting the colour of the latter, except that it is somewhat redder. The density of the compound is less than that of G., but the hardness is greater, and it is more fusible. It is this alloy which is employed in our gold coinage, 11 parts of G., being combined with 1 of copper, without which the coin would not be sufficiently hard to stand the wear to which it is exposed. Hence British standard G. contains 8·33 per cent. of copper. In

France, and in the United States, standard G. contains 10 per cent. of the latter metal. Jewellers alloy their G. with other metals, partly on economical grounds, and partly for the purpose of evolving special tints. Thus, red G. is obtained by combining 75 parts of fine G. with 25 of copper; green G., by combining 75 parts of fine G. with 25 of silver; dead-leaf G., by combining 70 parts of fine G. with 30 of silver; water-green G., by combining 60 parts of fine G., with 40 of silver; blue G., by combining 75 parts of fine G. with 25 of iron.

Mercury and G. combine very readily, and yield a white alloy, termed an *amalgam*, which is used in gilding. In consequence of the readiness with which these metals unite even at ordinary temperatures, mercury is used for the extraction of gold.

As a general rule, the ductility of G., is much impaired by alloying other metals with it, while its hardness and sonorousness are increased.

Two oxides of G. are known—a protoxide, AuO, and a teroxide, AuO_3. Neither of these oxides can be formed by the direct union of the elements, and both of them are reduced by heat. The protoxide is a dark-green or bluish-violet powder. It forms no definite salts. It is obtained by the decomposition of protochloride of G. with a solution of potash. The teroxide is a brown powder, which is reduced, not only by heat and light, but by many other reducing agents. It combines more readily with bases than with acids, and hence has been termed *auric acid*. We obtain it by mixing a solution of terchloride of G. with magnesia or carbonate of soda, and boiling.

Two chlorides of G. are known, corresponding to the oxides, viz., a protochloride, AuCl, and a terchloride, $AuCl_3$. Of these, the latter is the most important: it is obtained by dissolving G. in aqua regia, and evaporating the solution to dryness, at a temperature not exceeding 300 degrees, when we obtain this compound, as a deliquescent yellowish brown or reddish mass, which is soluble in water, alcohol, and ether, with which it forms orange-coloured solutions.

The chlorides of many of the organic bases from crystallisable double salts with the terchloride of G.; and these compounds are often employed to determine the combining power of the organic alkali.

Metallic G. in the form of a brown powder is thrown down from the solution of the terchloride by most reducing agents. This reducing power of protosulphate of iron is employed in the preparation of chemically pure gold.

A bisulphide of G. is obtained in the form of a black powder by passing a current of sulphuretted hydrogen through a cold solution of terchloride of gold. 'If finely divided gold be heated with sulphur in contact with carbonate of potash, a double sulphide of gold and potassium is formed; it resists a red heat, and is very soluble in water; this sulphur salt is used for gilding china, and produces the colour known as *Burgos. lustre.*' —Miller's *Elements of Chemistry*, 2d edit. vol. ii. p. 74.

Fulminating G., a compound known to the alchemists, who (Basil Valantine, for example) formed solutions of terchloride of G., occurs as a green powder, when

prepared by immersing teroxide of G. (or auric acid) in caustic ammonia. By modifying the mode of preparation, we obtain it of a brownish-yellow colour. From Dumas's analysis of the green powder, it seems to be represented by the formula $2NH_3$, AuO_3, the brownish-yellow powder having a more complicated formula. These powders detonate when rubbed, struck, or beaten, or when an electric spark is passed through them, with a loud sharp report and a faint light, and they yield nitrogen gas, ammonia, and water. None but professed chemists should attempt to prepare them, in consequence of their dangerous explosive character. On one occasion, a drachm of fulminating G. introduced into a bottle burst it as the stopper was being turned round, in consequence of small particles of it having adhered about the mouth, and both the operator's eyes were destroyed by the projected fragments of glass.

The *Purple of Cassius* is an important gold compound. It derives the name from its having been first described by Andreas Cassius in 1685.

None of the salts of the oxides of G. are of sufficient importance to require notice in this article.

Gold was, in all probability, one of the earliest discovered of its metals. The fact of its being found very generally distributed over the surface of the earth, and that, too, in its simple metallic state, combined with its beautiful colour, and many valuable properties, would cause it very early to attract the attention of man. Accordingly, we learn that gold was used by the Hebrews, the Egyptians, and other ancient nations, for much the same purposes as it is at the present day.

Previous to the great Californian discovery in 1847, Europe was to a great extent supplied with G. from Mexico, Brazil, New Granada, Chili, and Peru in North and South America ; a large quantity was also obtained from Asiatic Russia, and the islands of the Indian Archipelago ; the east and west coast of Africa furnished a less but still considerable quantity. All these countries still produce G., but their total yield, including Europe, is only about one-forth that of California and Australia.

The most famous mines in Europe are those of Hungary and Transylvania, which produce annually about £300,000 worth of this metal. Piedmont and Spain are almost the only other European countries where G. is worked ; but it is found in all districts where the rivers flow over primary rocks, though rarely in sufficient quantity to repay the expense of working it.

G. has been found in several parts of the British Islands. The most productive district yet discovered was that of Wicklow, in Ireland, where, towards the close of the last century, the stream-works were prosecuted for some time with considerable success. In Scotland, the Leadhills, on the borders of Dumfriesshire, as well as the Highlands of Perthshire, have at various times produced G. ; so also have Cornwall and Devonshire in England, and, at the present time, a small quantity is being obtained from North Wales.

First among the celebrated gold discoveries of recent times, in point of date, though not in importance, come those of Eastern Siberia, where extensive auriferous tracts were discovered in the governments of Tomsk

and Yeniseisk in 1842. The quantity obtained in these eastern regions raised the annual produce of the Russian empire to three, and ultimately to four millions sterling —more than triple its former yield. Concerning Russia, it may be well to remark that an examination of the auriferous deposits of the Ural Mountains led Sir Roderick Murchison, in 1844, on comparing their rocks with those brought home by Count Strzelecki, from Australia, to predict the presence of G. on the latter continent. Subsequent discoveries, as is well known, have proved the accuracy of this conclusion in a very remarkable degree.

The rich gold region of California was discovered in September 1847. Mr Marshall, the contractor for a saw-mill on the estate of Captain Suter—a Swiss emigrant, settled on the banks of the Sacramento River —detected particles of G. in the sand of the mill-race, and on further examination, it was found that valuable deposits existed throughout the bed of the stream. Intelligence of the discovery soon reached the town of San Francisco, whose scanty population at once abandoned their usual occupations to join in the exciting search for gold. The supply was soon found to be abundant over a large area ; it occurred in the tributaries of the Sacramento as well as in the bed of the river itself, in old water-courses, and on the sides of the hills. Emigrants quickly poured in from all parts of the American continent, and ere long from Britian, Germany, and other European countries, till the population of San Francisco alone rose from under 200 in 1845 to 40,000 in 1858. At first, it was thought that

the supply of G. from this region would soon fail, but it would appear by later researches to be far from being easily exhausted, as the supply, though now apparently decreasing, continued for several years at upwards of £13,000,000 per annum.

In 1851, before the excitement, of the Californian discovery had time to subside, the world was startled by the announcement of another, or rather by a series of others, of not less importance, in Australia. It is a curious fact that not only Sir. R. Murchison, as stated above, but also the Rev. W. B. Clarke, a native geologist, had pointed out the likelihood of G. being found in the eastern chain of the Australian mountains, several years before the value of the gold-fields near Bathurst was discovered by Mr Hargreaves in April 1851. This discovery was no sooner made, however, than several other places in Bathurst and the adjoining counties were found to contain rich deposits; so that, before many months had passed, 6000 persons were employed at these *diggings*. In August of the same year further discoveries of G. were made at Ballarat, in Victoria, which excelled in richness those of the Sydney district; and these in turn, were soon surpassed by fresh discoveries in the Mount Alexandra range. During the climax of the excitement created by the Victoria gold-fields, the number of diggers rose to upwards of 20,000, withdrawing for a time the great mass of the population from Melbourne and Geelong.

The modes of working adopted at the first start of the diggings were neccessarily rude and wasteful; the fortunes of the gold-seekers, too, were of course very

variable under such a system, many of them having made large profits—as much, in a few instances, as a thousand pounds and upwards in a single week—but many more met with nothing but dissappointment. A more systematic plan of mining, however, has now been introduced, by which the auriferous deposits are more completely worked out, and the labour of the miners rendered less precarious. Notwithstanding this, the annual produce of the Australian colonies has now (1862) fallen to about £8,000,000, only two-thirds of what they produced a few years ago. In the International Exhibition of 1862 there was a gilded pyramid 10 feet square at the base and 45 feet high, representing the mass of gold exported from Victoria between the 1st October 1851 and the 1st October 1861. Its weight in solid gold would have been 26,162,432 ounces troy, which, taken roundly at £4 per ounce, gives its value as £104,649,728. The produce of California since the discovery of its gold-fields in 1847, up to the present time, may be estimated at about 37,500,000 ounces, and its value at £150,000,000.

Since the two great gold regions of California and Australia became known, three new ones of considerable promise have been discovered—one of them in British Columbia, the value of which was proved in 1858, although previously it was to some extent known to the Hudson's Bay Company; another is being successfully developed in Nova Scotia; and a third in the province of Otago, in New Zealand, the recent accounts from which are very encouraging. It would appear that there is a great similarity between the general

rock systems and auriferous deposits of this region and those of Australia. Before passing from the subject of recent gold-fields, it is worth noting that, a few years ago, Dr Livingstone, the African traveller discovered G. near Tete on the Zambesi—a district which may be found to be rich in the precious metal, when more deliberately surveyed. Its position is remarkable as occuring in the centre of a coal-field.

The annual produce of G. in the whole world at the present time is somewhere between 30 and 40 millions sterling. Wherever G. is found, its origin can generally be traced to quartz veins in the primary or volcanic rocks, such as granite, gneiss, porphyry, clay-slate, or greenstone. As these rocks become decomposed by the action of the weather, portions of the auriferous veins are carried down by streams and floods, and so find their way into the deposits of sand, clay, and shingle in river beds, and in the gullies and flats of hills. Many auriferous drifts are of great thickness, formed by long-continued wasting of the rocks of neighbouring hills, and therefore require mining to a considerable depth. G. for the most part is found in small grains, or scales, called golddust; some of it, however, in pieces, or *nuggets* of considerable size. The largest yet met with was found at Ballarat in 1858, called 'The Welcome;' it weighed 2166 oz., and its value was £8376, 10*s*. 10*d*. A good deal of the Mexican and European G. is obtained from auriferous pyrites; that is, the sulphuret of iron, copper, or arsenic, with the G. disseminated through it.

Nearly all the metals except G. are found, for the most part, at least, as ores chemically combined with oxygen, sulphur, or other substances; and they therefore require to be separated by chemical processes. Gold ores, if we may use the term, generally only require to be mechanically treated by the processes of crushing, stamping, grinding, and washing. The amalgamation process, however, is resorted to when G. occurs in a state of fine division.

The crushing-mill consists of two large cast-iron cylinders or rollers revolving in some directions, which break the ore into small pieces, as it passes through between them. To reduce it further, a stamping-mill is used with iron shod piles of wood, or sometimes with stampers entirely of iron, wrought by an axle with projecting cams after the fashion of flint-mills and beetling, machines. To pulverise it still further, any form of grinding-mill is used, but the grinding surfaces should be of iron or of some hard rock like granite. The pounded ore is finally sifted and washed by machines, which vary in shape and mode of working but they all consist essentially of sieves, to separate the larger from the smaller particles, and an inclined table or frame across which a stream of water flows. The gold particles, on account of their greater specific gravity, remain at the head of the board, and the quartz and other impurities are carried forward and separated by the current.

By the above treatment, the greater part of the G. is extracted, but there still remain minute particles in-

visible to the naked eye mixed with the *gangue;* indeed, some auriferous soils contain all their G. in a state of extreme division. To recover this, the ore is partially concentrated by washing, and then an amalgam is made; that is, it is mixed with mercury, which has the power of seizing on and dissolving the gold particles, however minute. The mercury is afterwards distilled off in a cast-iron retort, leaving the G. nearly pure.

To give some idea of the quantity of G. used in the arts, of which very little can be recovered, it may be stated that in the United Kingdom some 30,000 ounces in the shape of leaf gold, 10,000 ounces in the electro-plate and other processes of gilding metals, and about the same quantity in gilding and making colours in the pottery districts, are annually consumed.

The quantity of G. poured into England during recent years has been immense.

What has become of it all is often matter of surprise. Much has been sent out to the mint, and much sent to foreign countries for their gold coinage. In France, Belguim, the Netherlands, and Italy, all large sums are now being paid in G. instead of silver as formerly. That the continued influx of G. is gradually heightening prices in the United Kingdom is sufficiently obvious. The current price of standard gold is about £3, 17*s.* 6*d.*

JASPER.

JASPER (Gr. *iaspis*), a mineral generally regarded as one of the varieties of Quartz (q. v.), and distinguished by its opacity, owing to a mixture of clay or other substances with the silica of which it is chiefly composed. There are many kinds of J., some of them of one colour, as brown, red, yellow, green, white, blue or black, and some variously striped, spotted, or clouded with different colours. J. is a very abundant mineral; it is found in veins and embedded in masses in many rocks, sometimes appears as a rock of which whole hills are formed, and is very common in the shape of pebbles. It has been prized from the most ancient times for ornamental purposes, as it takes a high polish. Many kinds of it are very beautiful; and it can often be obtained in pieces of large size, so that it has been much used not only for rings, seals, and other small articles, but for the decoration of palaces. One of the best known kinds of J. is found in Egypt, and is therefore called *Egyptian Jasper*. It is generally yellow, prettily mixed with brown.—J. with very distinct stripes is called *Ribbon Jasper*.—The kind called *Porcelain Jasper* is rather rare. It is often full of minute holes, or is cracked in all directions. It is regarded as a kind of natural porcelain, formed by the action of fire.

RUBY.

RUBY, a gem much prized, and only inferior in value to the diamond, or perhaps also to the sapphire. It is regarded by mineralogists not as a distinct species, but as a mere red-coloured variety of Sapphire (q. v.) or of Spinel. The *Balas R.* is rose-red. The Almandine R. is tinged with violet or brown. The finest red rubies are generally known as *oriental rubies*, and are indeed brought from the East, chiefly from Ceylon, and the Burman empire. The best generally come from the neighbourhood of Syriam, in Pegu. In Ceylon, rubies are found in remarkable abundance in alluvial deposits, which have been searched for them for ages, whilst the natives seem never to have thought of digging in the rock of the mountains; but Dr Gygax found innumerable small rubies, in a state of decomposition, falling to powder, in a state of stratum of gray granite with iron pyrites and molybdena; and Sir James E. Tennent thinks that mines might be opened with confidence of success. Sir Alexandria Burnes, describes a ruby-mine at Badakshan, in Bactria. Tavenier states that the throne of the great Mogul was adorned with 108 rubies, of from 100 to 200 carats each. The king of Arracan is said to have possessed a R. in the form of a six-sided prism, about an inch in diameter, terminated by a six-sided pyramid. But the greatest R. ever heard of was that possessed by the king of Ceylon, which, according to Marco Polo, was a span in length, as thick as man's arm, and without a flaw. Kublaï Khan sent an ambassador to demand this R., offering the value of a city

as its price; but the Ceylonese monarch refused to sell it. What has become of it is not known.

SAPPHIRE.

SAPPHIRE, a gem excelled in value by no precious stone except diamond, and regarded as a variety of Corundum (q. v.), highly transparent and brilliant. It is sometimes colourless, and the colourless kind, called *White S.*, is sometimes sold as diamond. It more frequently exhibits exquisite colour, generally a bright red or a beautiful blue; more rarely, gray, white, or green. The red variety is the Oriental Ruby (q. v.) of lapidaries; the blue is that commonly called S., and which has received this name from ancient times. It is found crystalised, usually in six-sided prisms, terminated by six-sided pyramids; and is sometimes found imbedded in gneiss; but it more frequently occurs in alluvial soils. It occurs at Bilin in Bohemia, and Expailly in Auvergne, but more abundantly in some parts of the East. Ceylon is famous both for its rubies and its sapphires, the latter being the more abundant. They occur with garnets and other minerals, in a stratum of water-worn pebbles firmly imbedded in clay, in which there are occasional lumps of granite and gneiss. But nothing has yet been done to seek for them in their original situation in the mountain rocks. A piece of S., which was dug out of the alluvium within

a few miles of Ratnapoora in 1853, was valued at upwards of £4000. The S., was one of the stones in the breastplate of the Jewish high-priest. Among the Greeks, it was sacred to Jupiter.—The name *Girosal S.* is given to a beautiful variety with a pinkish or bluish opalescence, and a peculiar play of light. The *Chatant S.* has more pearly reflections. The *Asteria S.* has in the midst of it a star of six bright rays, resulting from its crystalline structure.

THE WORKING OF PRECIOUS STONES.

The qualities for which Precious Stones are most prized, viz., lustre, transparency, refraction and dispersion of light, are to some extent visible even in their rough state; but in order to enhance these advantages, and render them more attractive, the stones must be subjected to artistic cleaving, grinding, and polishing.

The cleaving, grinding, and polishing appertain to the art of the lapidary, whose aim is so to manipulate the rough stone, as to produce regular, or symmetrical and smooth surfaces, called facets. The subsequent cutting of designs or mottoes in the polished stone belongs to the engraver.

It does not appear that the Ancients understood the art of the lapidary so well, or, at any rate, valued it so highly as we do. They preferred weight to brilliancy,

and size to effectiveness. They would have been horrified to sacrifice eighty carats of a stone weighing 186 carats, merely to enhance its effectiveness as a gem. Accordingly, we see that they were generally content to *rub down* the angles, polish the surfaces, and retain the fanciful shapes each stone possessed when discovered. In 1407 dimond cutting made great strides under Hermann, an able artist. The Duke of Burgundy gave a magnificent dinner at the Louvre to the King of France and his Court, and the noble guests received eleven Diamonds set in gold ; the value has been computed at £117 18s. sterling. These gems were but imperfectly cut, and yet with the intention and obvious effect of heightening the play of light, and thus rendering the gift more gratifying to the guests they were intended to honour.

In the inventory of the French Crown Jewels, in 1774, there is only one, with the number 349, to which the name "tenth Mazarin" is given. This was a four-cornered Brilliant, with somewhat obtuse angles, of pure water, weighing sixteen carats and valued at £2000.

Amsterdam has been one of the centres of the Diamond trade, and remains to the present day the principal seat of diamond-cutting. It is said that out of 28,000 Jewish inhabitants of Amsterdam, 10,000 are in some way or other connected with this business.

1—DIAMOND DUST.

The Diamond, the hardest of all known bodies, can only be manipulated by means of Diamond in form of a fine powder. This powder is prepared generally from

faulty Diamonds and from the refuse in cleaving and cutting; which, being put into a mortar of hardened steel, is beaten until it is fine enough for use. This powder in 1876 was worth from 8/- to 10/- a carat; it is now much cheaper.

2—CLEAVING OR SPLITTING OF DIAMONDS.

The cleaving or splitting of Diamonds serves a double purpose: firstly, that of removing faulty parts or spots from the stone; and, secondly, bringing out the facets in rough.

3—CUTTING AND POLISHING OF DIAMONDS.

There are three distinct operations in the cutting of Diamonds, namely, *splitting*, *cutting* and *polishing*. They form distinct branches of the trade.

By the operation of cutting, the natural crust of the diamond is removed, and the stone is formed into the shape required. In order to cut a diamond, 2 stones are employed, which are fastened into two sticks, the tops being filled with cement, into which each diamond is inserted, leaving exposed the part to be cut. The workman, who has leathern gloves on his hands, as well as leathern stall on his right thumb, takes a stick in each hand, and leaning them against two upright pieces of iron, fastened on the edge of the cutting bench, rubs the two diamonds together until he has produced a flat even surface (which is a facet), instead of the concaved or convex form of the natural stone. The dust or diamond powder which falls is received in a square box, containing oil, and the powder is burnt before being

used, to free it from the particles of cement that become mixed with it.

By this means two facets are cut on two different stones at the same time. During the cutting, the workman examines the facets by means of moistening the stone with the tongue, first taking care to remove any powder with a camel-hair pencil. When the facet is formed, the cement is heated, and the diamond taken out, and replaced so as to expose a different surface until the cutting is completed. It must be understood that by this operation only the general outline of the form is made.

A stone which would have, when quite completed, fifty-eight facets, including the table and culet, receives in cutting only eighteen, eight of which are the surfaces of an octahedron or double pyramid, and are formed by taking away eight edges or angles of these eight surfaces, one for the whole table, and one for the culet. The next process is polishing the diamond, by which the remaining facets are formed.

The grinding and polishing of Diamonds are effected on flat wheels, propelled by steam power, which make about 2000 revolutions per minute.

4—CUTTING OF PRECIOUS STONES GENERALLY.

This section embraces the cutting of all Precious and and Semi-precious Stones used for ornaments, except the Diamond. The lapidary arranges his work much in the same manner as the diamond-cutter, but he uses other means for the cutting and polishing, according to

the nature of the stone to be worked. These special means will be noticed under each particular stone.

5—THE FORMS OF PRECIOUS STONES.

The beauty of a finished stone depends so much upon the form and position of its facets, that a moderately fine stone, well cut and polished, is of far greater value than a large one less artistically worked. It happens sometimes that the lapidary receives a stone of very unfortunate shape ; his duty will, therefore, be to take all possible care to preserve its size ; and, hiding its faults, give it such a form as shall send it forth with the greatest weight and beauty.

6—PRECIOUS STONES AS OBJECTS OF COMMERCE.

The trade in Precious Stones is much more important now than formerly before the discovery of America, India was the great emporium.

It is calculated roughly, that the value of the Precious Stones found in the island of Ceylon is £10,000 yearly.

The Dutch East India Company formerly received the rough stones in packets, sealed with their special seal.

These packets were sold by auction, without being opened. Often from £2000 to £3000 were paid for one packet, and the buyer was very rarely wrong in his purchase.

In the trade of Precious Stones, the colored stones stand far behind the Diamond ; insomuch, that this stone alone represents 90 per cent., and the others altogether only 10 per cent. of the quantity on sale.

Apart from the class to which the stone belongs, the price is determined by its beauty, the quality and play of color, brilliancy, purity, rarity, the perfection of the cutting, and above all, its weight. This last quality increases the price considerably, as the most beautiful stones are generally found in small pieces.

At the Leipzig Easter Market, some years ago, Diamonds fell suddenly 50 per cent, owing to Don Pedro having paid the interest of the Brazilian State Debt to England in Diamonds instead of money, and thereby caused a glut in the market. In 1836 the price again rose. In 1848, in consequence of the Revolution in France, it fell greatly. From that year until 1865 the value of Diamonds seemed to have increased at about the rate of 5 per cent. per annum. Then, at the end of the Civil War in America, it sprang up suddenly 25 per cent. At the end of the Franco-German war of 1871 it rose another 10 per cent., and during the next two years there was a gradual rise amounting to 20 per cent, but their value has again considerably declined.

Notwithstanding the great hardness of the Diamond, it is so brittle that it can be reduced to Tesseral-shaped grains by a heavy pestle in a mortar.

Hardness is the best test of the genuineness of a Diamond. If a mineral cannot be scratched or cut by Ruby or Sapphire, it can only be a Diamond. The officers of the "Junta Diamantina," in Brazil, test the genuineness of two rough Diamonds by rubbing them together close to the ear, when, if they be real, they make a peculiar creaking or grating noise, which the long experience of the testers easily recognises.

Black Diamonds of great beauty are occasionally supplied by Borneo. These are so adamantine that ordinary Diamond-dust makes not the smallest impression upon them ; and they can only be ground or polished by using their own dust for the purpose.

CAPE OR SOUTH AFRICAN DIAMONDS.

Rather more than ten years ago, it happened that a child of Mr. Jacobs, a Dutch farmer, settled at the Cape, amused himself by collecting pebbles from the neighbourhood of the farm, near Hopetown. At first sight there might seem nothing remarkable in this circumstance, for pretty pebbles were to be had in plenty near the neighbouring river. One of the stones, however, was sufficiently bright to attract the keen eye of the mother, though she regarded it simply as a curious pebble, and gave it little more than a passing glance. It was afterwards examined by several eminent men, who pronounced it a genuine Diamond weighing $21\frac{3}{16}$ carats, and sold for £500. Such is the history of the discovery of the first Cape Diamond, a discovery, which being soon followed by others, led to the development of the great Diamond fields of South Africa.

A Dutch boer, named Tan Wyk, who occupied a farmhouse in this locality, was surprised to find Diamonds actually embedded in the walls of his house, which had been built of mud from a neighbouring pond. This led to examination of the surrounding soil, wherein Diamonds were found. On deepening the digging, Diamonds were still brought to light ; nor did they cease when the bed-rock was at length reached. Such was

the origin of the now famous Du Toit's Pan, South Africa.

A Diamond of pale yellow tint, weighing 112 carats, was brought to Prof. Tennant by an old student, and yielded a brilliant of 66 carats. Again, a stone of 124 carats was found at Du Toit's Pan, by Messrs. Stevens and Raath, on July 21, 1871. But the largest South-African Diamond yet discovered is the famous " tewart" which was consigned to Messrs. Pittar, Leverson & Co. It weighed in its rough state 288⅜ carats (nearly two ounces troy), and is the largest ever found in South-Africa, and, according to the best authorities, was only exceeded in size by three others in the world. It is of a light yellow color, beautifully crystallised.

Information has just come to hand of the finding of amother large Diamond—the second in weight and dimension yet discovered in South Africa. It was found on a *claim* at Du Toit's Pan, where Diamond-digging has been very successful. Several beautiful stones, of 50 carats each, have been discovered there; the one of 244 carats, being of a light off colour, may, by careful manipulation, prove a worthy gem. It is free from flaws, but is not of first quality. The value of the claims in these South African mines has risen enormously during the last twelve months (1878).

Ground that was originally sold at £50 for twenty square feet is now realizing many thousands of pounds.

Private advices from the fields, just to hand, announce the sale of two-quarter claims for £20,000! and that other claims have also been disposed of for similar sums.

Above 2,000 people flocked in the beginning of the year 1839 to search for Diamonds. For many years the result was successful, but only at the cost of much labor.

The profit made in Minas-Geräes was very considerable. In the first twenty years 144,000 carats were found annually.

In 1772 the Government first worked the mines on its own account. Rich as the find was, the cost was enormous, for every carat cost the Government from fifteen to eighteen shillings.

Up to 1850 the Province of Minas-Geräes had yielded about 5,844,000 carats of Diamonds, valued at £9,000,000.

If, in addition to this, we consider the contraband trade at the beginning of this century, estimated at £2,000,000, the worth of Diamonds found in Minas-Geräes would be about £11,000,000. The yield of these mines differs from that of the Bahia mines in shape and color. The form of the stones is more regular, while the color is more uniform in its greenish tints, less, if at all, vitiated by any yellow reflection.

Diamonds were found also in other parts of Brazil, especially in the inland provinces.

Large Diamonds are very rarely found. It has been estimated that in ten thousand specimens rarely more than one weighing twenty carats is met with, while possibly eight thousand of one carat, or less, may be discovered. In 1851 a diamond weighing 120⅜ carats

was discovered at the source of the Patrocinho River, in the province of Minas-Geraes.

Somewhat later, on the Rio-das-Belhas, the laborers came upon a stone of 107 carats weight, and in Chapada upon one of 87½ carats. The largest, however, which has been discovered of late years is that called the "Star of the South," which weighed 254 carats before it was cut.

The discovery of these Precious Stones proved in 1746 a great curse to the poor inhabitants on the banks of the Diamond Rivers. Scarcely had the news of the discovery reached the Government ere they tried to secure the riches of these rivers for the Crown. To effect this the inhabitants were driven away from their homes to wild, far away places, and deprived of their little possessions; nature herself seemed to take part against them: a dreadful drought, succeeded by a violent earthquake, increased their distress. Many of them perished, but those who lived to return on the 18th May, 1805, were benevolently reinstated in their rightful possessions.

Strange to say, on their return the earth seemed strewn with Diamonds. After a heavy shower the children would find gold in the streets, and in the brooks which traversed them. The little ones would often bring in three or four carats of Diamonds. One negro found a Diamond at the root of a vegetable in his garden. Poultry, in picking up their food, swallowed Diamonds, so that their viscera required searching before being disposed of.

The profit of the Diamond seeker is a very uncertain quantity. While one person may find at one spot in a river 1440 carats, another, like the Spaniard Simon, may seek four years, with the help of 200 slaves, and obtain only 7,000 carats. The comparatively large wages demanded by laborers induce employers to limit the number employed as soon as the product of the finding is diminished.

The number of diamond-seekers gradually dwindled to between five and six thousands ; but up to the end of the year 1849 there had been as many as 932,400 carats of Diamonds obtained from the Chapada of Bahia.

This rich field is about eighty miles long and forty miles broad. The total produce from the entire Brazil Diamond district was calculated up to the year 1850 to exceed 10,000,000 carats. In the year 1851 the produce appeared to be increasing ; but in 1852 it was evidently on the wane.

The estimated value of Brazilian Diamonds from 1861 to 1867 was about £1,888,000.

INDIAN DIAMONDS.

The largest and most celebrated found in India is that described by Tavernier as the "Great Mogul."

In its rough state it weighed 787½ carats, but was reduced by cutting to 297 carats.

Since the year 1818, Sumbulpoor has been under British rule. In that year a Diamond was found which weighed 84 grains, and although of only the third quality was sold for 5,000 rupees.

COLORED DIAMONDS.

The Brazilian mines, although yielding many colored Diamonds, are not known to have produced a single example of the dark blue variety. The same remark applies to the South African mines, which have not as yet given to the world either a green or a blue specimen.

The first mention we have of a Blue Diamond in Europe refers to a stone then considered unique. It weighed in the rough 112¼ carats, was bought by Tavernier in India in 1642, and was sold to Louis XIV. in 1668.

RED DIAMONDS.

The true Red Diamond is valuable "according to the glorious beauty of its perfection."

GREEN DIAMONDS.

The history of the finest specimen of a Diamond of this color may be not uninteresting. Twenty years ago this stone was obtained for £200. Some years after it was sold for £300. Subsequently it passed into the possession of a jeweller in Bond Street, who sold it to an American for £600. Mr Charles Drayson is now its owner; should it be again transferred it would probably be purchased to enrich the regalia of one of the great European courts.

DIAMONDS OF UNWONTED COLOUR.

His Grace the Duke of Wellington possesses a very fine Black Diamond, weighing 12¼ carats, which was valued in 1869 at £183 15s. In the "Hope Collection,"

exhibited in 1851, were three Brilliants of unusual tint—one pink, cushion-shaped, the weight of which was 28 carats; the second, lilac-hued, of oval shape, weighing 11 carats; and a third of an apricot color, or a mixture of peach and orange.

CELEBRATED DIAMONDS.

The "*Braganza*" now among the Portuguese State Jewels, is a gem, ranked as a Diamond, of the size of a hen's egg weighing in its rough state 1680 carats, and valued at £58,350,000.

Another celebrated Brazilian Diamond, weighing 138½ carats, is among the treasures of the King of Portugal, It was found in 1775 by a negro, a few miles north of the Rio Plata, and as a reward he obtained his freedom and a yearly income of £50.

PRICE OF BRILLIANTS.

In addition to the universal experience that exceptionally large and pure Brilliants are as matters of competition in value altogether abnormal, yet there is a further element of uncertainty introduced into the market arising from the extension of the Diamond fields. To what limit this may eventually influence the price of Diamonds, or whether the demand may not still exceed the supply, it is difficult to forecast. The

following table may be a fair guide to approximate values of smaller stones :—

Diamonds below two grains—

Inferior from	£3 to £5	per carat,	finished	
Medium ,, ...	£5 to £7	,,	,,	,,
Good ,, ...	£7 to £10	,,	,,	,,
Fine ,, ...	£10 to £12	,,	,,	,,

ROUGH DIAMONDS.

It is difficult, nay imposible, to quote a standard price for Rough Diamonds. The remark universally applicable is that the value must vary immensely according to size and quality.

PRICES, SIZES, AND WEIGHTS OF DIAMONDS.

Cut Medium Quality. (Workmanship not included.)

£	s.	d.	Carats.	£	s.	d.	Carats.	£	s.	d.	Carats.
8	0	0	1	242	0	0	$5\frac{1}{2}$	1800	0	0	15
10	2	6	$1\frac{1}{8}$	288	0	0	6	3200	0	0	20
12	10	0	$1\frac{1}{4}$	338	0	0	$6\frac{1}{2}$	5000	0	0	25
15	2	6	$1\frac{3}{8}$	392	0	0	7	7200	0	0	30
18	0	0	$1\frac{1}{2}$	450	0	0	$7\frac{1}{2}$	9800	0	0	35
21	2	6	$1\frac{5}{8}$	512	0	0		12800	0	0	40
24	10	0	$1\frac{3}{4}$	578	0	0	$8\frac{1}{2}$	16200	0	0	45
28	2	6	$1\frac{7}{8}$	648	0	0	9	20000	0	0	50
32	0	0	2	722	0	0	$9\frac{1}{2}$	24200	0	0	55
50	0	0	$2\frac{1}{2}$	800	0	0	10	28800	0	0	60
72	0	0	3	882	0	0	$10\frac{1}{2}$	33800	0	0	65
98	0	0	$3\frac{1}{2}$	968	0	0	11	39200	0	0	70
128	0	0	4	1058	0	0	$11\frac{1}{2}$	51200	0	0	80
162	0	0	$4\frac{1}{2}$	1152	0	0	12	64800	0	0	90
200	0	0	5	1250	0	0	$12\frac{1}{2}$	80000	0	0	100

THE FOLLOWING TABLE IS FROM MR H. EMANUEL'S WORK ON DIAMONDS.

				Value in 1865.		Value in 1867.
A brilliant weighing	½	a carat	...	£5 10s	...	£6 0
,, ,,	¾	of a carat	...	£9 10s	...	£11 0
,, ,,	1	a carat	...	£18 0s	...	£21 0
,, ,,	1¼	carats	...	£28 0s	...	£35 0
,, ,,	1½	,,	...	£38 0s	...	£45 0
,, ,,	1¾	,,	...	£48 0s	...	£55 0
,, ,,	2	,,	...	£65 0s	...	£80 0
,, ,,	2¼	,,	...	£70 0s	...	£90 0
,, ,,	2½	,,	...	£88 0s	...	£110 0
,, ,,	2¾	,,	...	£100 0s	...	£120 0
,, ,,	3	,,	...	£125 0s	...	£140 0
,, ,,	3¼	,,	...	£135 0s	...	£150 0
,, ,,	3½	,,	...	£150 0s	...	£175 0
,, ,,	3¾	,,	...	£175 0s	...	£190 0
,, ,,	4	,,	...	£220 0s	...	£220 0
,, ,,	4¼	,,	...	£230 0s	...	£240 0
,, ,,	4½	,,	...	£250 0s	...	£300 0
,, ,,	4¾	,,	...	£280 0s	...	£330 0
,, ,,	5	,,	...	£320 0s	...	£350 0

The least defect, want of (or over) spread, or faintest tinge of any colour, reduces these values considerably.

RUBIES.

In this our day fine Rubies under half a carat—

If English cut, cost from ... ... £4 to £10
If Indian cut ,, ... £1 to £ 4

Those over a carat in weight are, according to the quality, worth from £20 to £100 per carat : but no definite price can be given as a guide to the purchaser.

The two most important Rubies ever known in Europe, were brought into this country during the year 1875.

One was a dark-colored stone, cushion-shape, weighing 37 carats, the other, a blunt, drop shape, of $47\frac{1}{16}$ carats.

It was deemed advisable to have these stones recut; and the work was entrusted to Mr. James N. Forster, of London, who recut the stone of 37 carats to $32\frac{5}{16}$, and the one of 47 carats to $38\frac{9}{16}$. They were much improved thereby, and competent judges pronounced them the finest stones of their size yet seen, their color being truly magnificent. The smaller stone of the two, it is affirmed was sold abroad for above £10,000; the larger one, it is stated, found a purchaser on the Continent at £20,000.

The fact of two such fine gems appearing contemporaneously is unparalelled in the history of Precious Stones in Europe.

SAPPHIRES.

The value of Sapphire stones is very much determined by special circumstances and, like the Diamond, its color, purity, and size are taken into consideration when fixing the sum to be paid. Fine Sapphires under the carat in weight, if English cut, vary from £4 to £12; if Foreign cut, £2 to £5; those of a carat weight, £12 to £25. Sapphires do not necessarily, like the Ruby, rise in price, as they increase in size.

The most important Sapphires known in Europe are two magnificent stones exhibited in the London Exhibition of 1862, and also in the Paris Exhibition of 1867. The larger is a stone of a somewhat oval form, of a dark, slightly inkey, color, free from defects. It weighs about 252 carats, and was cut from the rough by Mr Loop in 1840. The other, although a smaller, is a richer colored stone. It was brought to this country from India (Indian cut) in the year 1856.

In its original form it presented a mis-shapen stone weighing 225 carats, with a large yellow flaw at the back, which marred the stone by casting a green reflection into it. It was placed in the hands of Mr J. N. Forster, who re-cut it, removed the defects and made it a splendid gem of 165 carats. This is by far the finest Sapphire of its size in Europe. It has recently been sold in Paris, and is estimated to be worth from £7,000 to £8,000.

EMERALDS.

One of the most celebrated Emerald mines of the Tunka Valley is that of Muzo, 5 degrees 39.50 N. latitude, and 76 deg. 45 W. longitude (from Paris). N.N.W. of Bogata. It was discovered by Lanchero 1555, but the Spaniards did not commence working it until 1568.

It is now worked by a company, who pay an annual rent for it to the Government, and employ 120 workmen.

The value of an Emerald depends greatly upon its color; for example :—

A light color, almost white, is worth	5/-	a carat
Lightest geeen	20/	,,
A fair body of color	100/	,,
Good color, with flaws, from	£10 to £15	,,
Pure color and clear, ...	£20 to £30	,,
Very fine dark color, velvety, and without flaws, as high as	£40 to £60	,,

This last, however, is very rare. Perhaps there is no stone which suffers more than the Emerald from inequality of structure, color and transparency, clouds

and spots. Fashion greatly influences the value of the Emerald.

SPINEL AND BALAS RUBIES.

In the inventory of the French Crown Jewels, in the year 1791, we find the following:—

One Spinel Ruby of	$56\frac{3}{4}$	carats	...	£2,000
One ,,	$4\frac{2}{5}$	,,	...	£12
One ,,	$3\frac{3}{4}$	,,	...	£12
One Balas Ruby	$20\frac{3}{8}$	,,	...	£400
One ,,	$12\frac{3}{8}$	,,	...	£120

At the present time small stones range from... ...	5/- to 10/-	a carat
Medium stones, of fair color	20/- to 40/-	,,
Large stones	60/- to 100/-	,,

Specimen stones attain even a higher value.

Balas, called Balais Ruby, are pale-red, or rose-red gems, with a tinge of blue appearing at the angles of the octahedron, which gives them a milky kind of shimmer and depreciates their value. The color is due to chromic acid. The Balas Ruby varies much in price; for example, a dark-rose of 18 millimetres, square-cut, and polished as a Brilliant, pure and lustrous, will sell for £12, while a pale-rose of like size will be worth sixteen shillings only; its value depends entirely on the demand and the charactor of the stone, occasionally a fine specimen of five carats will relize £50.

THE GARNET.

New varieties of Garnet have recently come into the market from Siberia: in color a beautiful green, very brilliant, and unlike any stone already known.

Another closely resembles the Burmese Ruby in color. It is found in the interior of Mexico, but is obtained with difficulty. Lapidaries were at first unable to determine, by mere cutting, the nature of this stone, for no Garnet had ever been seen in Europe possessing a color so closely approaching that of the Ruby.

PEARLS.

In America, and since the beginning of the 17th century, the Pearls of California have been rivals of the treasures of Panama. Hundreds of poor Indians are now employed in California as divers. On the coast of Columbia the Pearls are of a peculiar and beautiful lustre, and on the south side of the island of Cuba the product is similar to that of the Persian Sea. On the coast of New Jersey, Pearls were discovered by a farmer, who, fishing for oysters, found in one of them a large Pearl; this stimulated fresh adventures, which have been rewarded by the discovery of large pearls, of fine quality.

Of late years Pearls have been discovered in Australia, and fine specimens have been shipped to England.

The Empress Eugenie had presented to her a necklace composed of Pearls found in the Fiji Islands, which was valued at several thousand pounds.

It is computed that out of 20,000,000 oysters 4,000,000, or one-fifth, contain Pearls.

The Romans called the large ball-shaped Pearls "Uniones"; the pear-shaped Pearls "Elenchi"; and the half-ball shape "Tympania." Those which possessed the most beautiful white color received the name of *Exaluminate Margaritæ*.

Pompey, the Conqueror of Pontus and Syria, found in the palace of Mithridates, a priceless collection of Pearls, which formed the foundation, in later years, of a museum in Rome. In his third great triumph against the Asiatic princes, 61 years B.C., he took thirty-three crowns of Pearls. After this period the Pearl luxury became quite a *furore* in Rome. The philosopher Seneca spoke very sharply against the Roman women for wearing so many Pearls. He declared that they would not bend, nor give obedience to their husbands, until double or treble the value of their own settlements was dangling from their ears. Roman ladies wore necklaces of Pearls which cost £8,000. Ornaments for the breast, for dresses, ladies' shoes, and bracelets were also profusely covered with costly Pearls. Julius Cæsar presented to Servilia, mother of Marcus Brutus, a magnificent Pearl which he obtained as booty in Egypt, the value of which was estimated at £39,600.

Another famous Pearl, in possession of the Egyptian queen, Cleopatra, was, after her death, presented by a Roman ambassador to the Emperor Septimus Severus for his wife ; but he, it has been stated, to rebuke the ever-increasing tendency to luxury, ordered it to be sold for the good of the State. No purchaser, however, could be found for it at its estimated value, whereupon the emperor had it cut into two pieces, and made into ear-rings for the image of the goddess Venus, which was in the Pantheon, saying that the Empress would be setting a very bad example to his subjects if she wore in her ears things too valuable to be paid for.

The Romans used also to decorate their temples and dwelling-houses with Pearls, and ladies used to hire them for their own personal adornment at great festivals, so that the Margaritarii, or Pearl Merchants, drove a flourishing trade by the loan of Pearls. The wife of Caligula wore, in her parure, Pearls to the value of £28,000. Nero distributed Pearls lavishly among his favourites; and it is stated that Claudius dissolved Pearls in a *very strong* acid, whlch he gave to his guests. Pearls are frequently found of grotesque shapes, and are generally used as caricatures in works of art. There is a very large collection of such in the Green Vaults at Dresden—one, a Spanish Court dwarf of the time of Charles II., made out of a Pearl the size of a hen's egg. One of the largest known in Europe was called "La Peregrina Incomparable." It weighed 126 carats, and was pear-shaped. Gongibus of Calais brought it from India in 1660. When laid before Philip IV., King of Spain, he said—"How could you concentrate your whole fortune upon so small a thing?" To which the merchant replied—"Because I knew that the world held a King of Spain who would buy it of me." The gem is now in the possession of Princess Youssopoff, and has been valued at £16,000. Another large Pearl of the form and size of a pigeon's egg, weighing 134 grains, came from Panama; it belonged to Philip II., of Spain, and was valued at £10,000. The Emperor Rudolph II. possessed one of 180 grains, and Napoleon I. had one nearly as large. The Pearl which the King of France gave to Madame de Maintenon, and which was offered for sale in 1819,

weighed 111 grains. The Pearl belonging to the Shah of Persia is above an inch in diameter, and in 1633 was valued at £64,000; and that in possession of the Sultan of Muscat at £32,000. The Crown Prince of Germany gave a necklace of thirty-two Pearls, valued at £20,000 to his bride, the Princess Royal of England. It should be borne in mind that all the values just quoted are *relative* values, and that much larger sums are represented by these figures. The finest white Pearl ever seen in this country was sold for £2,600. It weighed 115 grains, was perfectly round in shape and of brilliant sheen. During the past year (1878) another Pearl, weighing 114 grains, was in the market; the two were exhibited in the Paris Exhibition, and are now in the possession of the Baroness Alphonse de Rothschild. No European regalia contains such a pair; they are thought to be unique.

DIAMONDS.

AN EXPLANATION OF SOME OF THE TERMS MADE USE OF IN DESCRIBING THEIR MAKE AND FINISH.

The Bezils are upper sides and corners of the brilliant, lying between the edge of the table and the girdle. The Collet is the small horizontal plane or face at the bottom of the brilliant. The Crown is the upper work of the rose, which all centres in the point at the top, and is bounded by the horizontal ribs. The

Facets are small triangular facets or planes, both in brilliants and roses. In brilliants there are two sorts; show or skill facets, and star facets. Skill facets are divided into upper and under. Upper skill facets are wrought on the pavilions, and terminate in the girdle; Star facets are wrought on the upper part of the besil, and terminate in the table. The Girdle is the line which encompasses the stone, parallel to the horizon, or which determines the greatest horizontal expansion of the stone. Lozenges are common to brilliants and roses. In brilliants they are formed by the meeting of the skill and star facets on the bezil; in roses, by the meeting of the facets in the horizontal ribs of the crown. Pavilions are the under sides and corners of the brilliant, and lie between the girdle and the collet. The Ribs are the lines or ridges which distinguish the several parts of the work, both of brilliants and roses.

THE PERFECTIONS AND IMPERFECTIONS OF DIAMONDS.

Here it may be proper to observe, that what is commonly called the "first water" in Diamonds means the greatest purity and perfection of their complexion, which, as previously stated, must be like a drop of the clearest spring water. When any species of Diamond falls short, more or less, of that perfection, it is expressed by saying it is of the "second" or "third" water, &c., till a stone may properly be called a coloured one. To speak of a stone imperfectly coloured and containing any other defects, as a stone of a "bad water" only, is very improper, as it does not convey

an idea of the particular colour or defects belonging to it.

METHOD OF VALUING WROUGHT DIAMONDS.

An example is here given to show in what manner the value of a manufactured or wrought Diamond of one carat is to be found, upon the principle advanced. Suppose rough Diamonds to be valued at £2 per carat, the weight of such stones must be doubled, on account of half being lost in working them, which is considered their original weight, making two carats; then multiply the weight of each stone by itself, which squares it and makes four; lastly, multiply the four by two, which produces eight Pounds, which is the value of one carat wrought or polished, and is equal to the value of rough Diamonds of two carats, out of which it is suposed to be made. This single instance is here given to show the value of rough Diamonds in the price of wrought ones. As a further explanation of the rule of valuing them, and previously to offering any other, it is to be observed that although two Pounds is laid down as the general price of rough Diamonds, it is to be understood that rough Diamonds differ in their value according to their different degrees of perfection, and according to the loss of weight they may be supposed to sustain in being truly wrought, as it is well known that some will lose more than others, from their ill form and other defects that may attend them.

FIRST INSTANCE.

To find the value of one of five carats the weight must be doubled, on account of half being lost in working,

that replaces its original weight and makes ten carats; then multiply by ten, that squares its weight and makes 100 carats; and lastly, 100 must be multiplied by two Pounds, the price of one carat, which produces £200, and is the value of a wrought stone of five carats, the price of the Diamond when rough.

SECOND INSTANCE.

To find the value of one of 5⅛ carats, the weight doubled, 10¼ carats; next reduce that weight in the foregoing manner, that makes every carat in the stone worth £20 10s; so first multiply by £20, that brings it to £200, then multiply ten carats by ten shillings, that makes 100s. or five Pounds; next add the value of one fourth of a carat at the rate of £20 10s, that makes £5 2s 6d; lastly, cast up these three sums, the total will be £210 2s 6d, and is the value of the stone rough or wrought.

THE METHOD OF VALUING WROUGHT DIAMONDS, EXCLUSIVE OF ROUGH ONES.

As instances have been given of two different methods of attaining the value of wrought Diamonds, in which cases the value of rough Diamonds of double their weight have been jointly considered, they being supposed to be made from such rough Diamonds, three instances of manufactured Diamonds of the same weight will be offered to show in what manner their value may be found, exclusive of any regard to rough ones; and as the last method appears to be shortest, and more easy to be understood, that method will be made use of on this occasion. This is to be known by

applying the price they bear manufactured, so far as has been known, viz:—that as rough Diamonds are valued at two Pounds per carat, a wrought Diamond of one carat is worth eight Pounds; so to find the value of a stone of that degree of goodness, whatever number of carats are contained in such Diamonds, each carat is to be valued at eight Pounds, and whatever sum they make must be multiplied by the weight of the Diamond. The instances are as follow:

FIRST INSTANCE.

To find the value of such Diamonds of five carats weight, reckon every carat at eight Pounds, that makes £40: so every carat is to be valued at £40, then multiply five by £40, that produces £200, and is the value of such a Diamond.

SECOND INSTANCE.

To find the value of $5\frac{1}{8}$ carats, at the rate of eight Pounds per carat, multiply five by eight, that makes 40; then add to that the value of $\frac{1}{8}$ of £8, that is one Pound, so the value of every carat is £41; then multiply five by 41, that makes £205; next add the value of $\frac{1}{8}$ of £41, that makes £5 2s 6d. These two sums cast up produce £210 2s 6d, and is the value of the Diamond.

ON THE VALUE OF PEARLS.

These jewels are next in importance to the sapphire or ruby, and the finest kinds are perfectly round, which fits them for necklaces, bracelets, jewels for the hair, &c.; but if a Pearl be of a large size and shape of a

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pear, it is not reckoned an imperfection, for it may be suitable for drops for ear-rings, solitaires, and many other jewels ; their complexion must be of a milk-white, not of a dead and lifeless hue, but of a clear and lively hue, free from stains and roughness,—such are of the highest value. The only rule for valuing them is by the square of their weight, as in the case of diamonds.

GOLD.

ITS VARIOUS QUALITIES AND ALLOYS.

Fine Gold is too soft to stand the wear and tear of ordinary use, hence arose the necessity for the incorporation of some other material to give it increased hardness. The following table gives the relative value of the different carats, and the proportion of alloy to be added, taking 24 as the unit of fine gold :—

Qualities of Gold.		L	s	d	Alloy to be added	
24	carats.	4	5	0	None.	
22	,,	3	17	11	2	carat
20	,,	3	10	10	4	,,
18	,,	3	3	9	6	,,
15	,,	2	13	1½	9	,,
14	,,	2	9	7	10	,,
13	,,	2	6	0½	11	,,
12	,,	2	2	6	12	,,
10	,,	1	15	5	14	,,
6	,,	1	11	10½	15	,,
8	,,	1	8	4	16	,,
7	,,	1	4	9½	17	,,

The above value represents the ounce troy, and is quoted at the mint price of purchase. The purchasable

price of fine gold from refiners will be a little higher than that given in the above table, on account of the expenses in refining; in large quantities, say over 10 ozs., it will cost from £4 5s 3d to £4 5s 6d per ounce. In smaller quantities, it will cost from £4 5s 6d to £4 6s per ounce; therefore, if 1 oz. of fine gold be required, it will cost £4 6s nett, from all houses.

In judging of a piece of work of alloyed gold, the value (if with a view of sale) must not be calculated merely upon the amount of fine gold the piece of work contains; for, in that case, the calculation as to the real value will be wrong and misleading; because in the alloy there is a certain proportion of silver, and as this metal is rather expensive, a loss would occur by the transaction. For example, if we take the proper proportion of fine gold existing in an ounce of 18-carat gold, at the mint value as given in the table, £3 3s 9d, to obtain that amount of gold from the refiner in the best market it will cost £3 4s 3d (the increase being due to the expenses in refining), in order to produce that fine state of division required for alloying. Now, in order to produce 18-carat gold 5 dwts. or 6 carats of alloy, must be added to the quantity of fine gold of the above value; if we say half silver and the other half copper, at the lowest trade price it will cost 9d: so to practically produce an 18-carat alloy of gold it will cost £3 5s per ounce to the manufacturer of jewellery before he actually introduces it into his workshop. All other alloys should be calculated after the same manner, and we should say an ounce of 8-carat gold is worth £1 10s.

The use of 22-carat gold as our national standard of value for the coinage is well known, but a few additional particulars will not be irrelevant to that branch of the subject upon which we are now entering. Gold coins, when first introduced into the currency of England by Henry III., were of fine gold, that is to say 24 carats. Edward III. was the first English king who used gold coins of an inferior standard, in the form of 6s pieces, nearly equal in size to the present sovereign, and consisting of $23\frac{7}{8}$ carats. A coin called a noble followed, worth 6s 8d. Edward IV. reduced the standard to that of 18 carats. The next change was made by Henry VIII, raising it to 22 carats. From that time until the reign of Queen Elizabeth the currency underwent various changes; but it was then again fixed at 22 carats, and it has so continued with about one exception down to the present time. All English gold coins are nominally and intrinsically worth the sums they represent. This is so when they leave the Mint, and have not been subjected to the wear and tear of circulation.

Besides the standard fineness for coins, there is also a legal weight, fixed according to the regulations of the Mint. Thus in England a pound troy of the standard metal is worth £46 15s, so that if a single pound troy of standard gold were taken to the Mint to be coined, after forty-six sovereigns and one half-sovereign had been manufactured out of it, a portion of gold of the value of 5s, not used up in the coins, would remain. The same quantity will coin $44\frac{1}{2}$ guineas, of the value of 21s each; hence the value of standard gold is £3 17s 11d per ounce.

The coinage of gold is conducted with great exactness by the officers of the Mint, with respect to weight; and the extreme accuracy with which they are compelled to work will be shown by the following extract from the first schedule of the Coinage Act 1870.

The imperial weight in grains only is here given:

Coin.	Weight.	Remedy.
Sovereign ...	123·27447	0·20000
Half-Sovereign	61·63723	0·10000

The standard fineness for gold coins is 11-12ths fine gold and 1-12th alloy, or millesimal fineness 916·666, the remedy being millesimal fineness 0·002 = 1-500th of a grain. The guinea is of the same standard as the sovereign in fineness, but differs in weight, hence its value of 21s. A guinea weighs 5 dwts. 9½ grs.; and a sovereign 5 dwts. 3¼ grs. and a fraction of a grain; of which 4 dwts. 22¾ grs. and 4 dwts. 17 grs. respectively are fine gold. Since the reign of George III. guineas have not been coined for circulation. There is also a difference in the colour. Guineas look yellow, while the modern sovereign shows a deep red tint. This denotes an alloy of silver in the former, and one of copper in the latter. Our gold coins are now always alloyed with copper, with the exception of those manufactured by the colonial mint at Sydney, in Australia, for which silver is employed. These can easily be distinguished from English coins by their greenish-yellow cast, even without a close inspection of the impression of the die, which is slightly different upon the obverse side; whilst upon the reverse, besides other

distinctive features, it has the word *Australia* stamped upon it.

Twenty-two-carat gold, besides being made into coins, is very largely used in the manufacture of wedding rings, which must be of this quality. So keen is the competition in this branch of industry, that a wedding ring may now be purchased from the manufacturer for a very little above its real value in gold.

Wedding-ring makers have to pay a duty upon their manufacture of 17s per ounce, 1-6th being remitted for loss in finishing; because it is compulsory that this quality should, when made into wedding-rings, be *Hall-Marked*, and this has to be done when the articles are in a half-finished state; therefore, for every six ounces you pay for five, and so on. For this reason it is usual to melt down the coin of the realm, and for more purposes than one it is an advantage to wedding-ring manufacturers to do so, for they can then depend upon the quality, and also effect a saving of from 4d to 5d per oz.—a gain to a large firm not to be lost sight of, in these days of eager competition. Twenty-two-carat gold is also used in the manufacture of mourning-rings, but to a more limited extent than the above. In some instances, watch-cases are made of 22-carat gold; but English watch-cases more commonly consist of 18-carat gold. Watch-cases (English) bear the mark of Goldsmith's Hall as a guarantee of their quality, and are manufactured duty free.

In Ireland 20-carat gold is a legal standard, and has been so from the year 1784, in the reign of George III.

This standard was established, principally, to encourage the manufacture of watch-cases and jewellery, it being at that time illegal to manufacture articles of this description inferior to 22-carat gold.

Wedding-rings, if of 18-carat gold, or of the higher standard to which we have already referred, must pay duty upon the manufacture of 17s per oz. 1-6th part, as usual, being remitted for waste in finishing. It is compulsory that these articles should be hall-marked, and bear the stamp of the properly authorised officials of the town in which they are made.

COLOURS OF GOLD.

Yellow Gold—pure or fine gold, 24 parts.
Red Gold—fine gold 18 parts, copper 6 parts.
Green Gold—fine gold 18 parts, silver 6 parts.
Blue Gold—fine gold 18 parts, iron 6 parts.
White Gold—fine gold 12 parts, silver 12 parts.

According to the provisions of the Assay Act of 1854, 15-carat gold can now be assay-marked as a guarantee of proper fineness, but it is not compulsory unless requested by the purchaser. There is no duty on its manufacture, neither is there on that of 18-carat gold into chains, studs, lockets, charms, fancy rings, &c. Purchasers of 15-carat goods should beware of an inferior quality of gold introduced into the trade and called 15-carat, bearing a stamp something similar to the hall-mark; however, this is not the hall-mark, but the private mark of the manufacturer. Nevertheless the general public who are conversant with the prices at which these articles are sold, will at once see that

this is not done with the intention of representing the quality as equal to 15-carat, by a glance at our table of values for the various qualities. We shall now give an account of the different qualities in general use.

Thirteen-carat gold is called common when speaking of coloured golds, for the reason that it is about the lowest quality that can be conveniently coloured to look rich and beautiful. A slightly inferior quality (12½ carat) can be coloured, but 13-carat is about the usual kind employed in all respectable coloured-gold houses. In Birmingham a very large quantity of gold is weekly employed in manufactures of this quality.

Some firms manufacture nothing else. It is largely made into chains, lockets, pins, studs, sleeve-links, solitares, pendants, braclets, rings, brooches, and filigree ornamentation. In fact, almost every article we can mention has it in some part of its composition. If the reader were to take a walk down any of the principal streets in Birmingham, viz., New Street, Bull Street, or High Street, the vast majority of articles of coloured gold jewellery exhibited in the shops that met his eye would be of this quality, and marked as 15-carat fine gold. The retail purchasers are, of course, in most instances, ignorant of the true value of gold and the art of alloying, and some, on the representations of the shopkeepers, who often know no better, believe that they are buying full 15-carat gold of the proportion expressed in the Act of 1854. It is a difficult matter too, even in this enlightened age, in which the secrets of the goldsmith's craft are freely and openly expressed, to convince them of the error of their belief. Some

manufacturers profess to have secrets in the art of producing good colours for their wares; and there is, no doubt, a motive for this, namely, the producing a demand for the articles of special firms, well known for excellence of finish, over all others. To understand perfectly the art of alloying gold and silver is of very great importance, and an advantage to manufacturing goldsmiths, besides having a tendency to produce profitable results, more than anything (if the practical part be understood properly) connected with the art of the goldsmith.

Twelve-carat gold is the best of the bright golds, and is so called to distinguish it from the coloured; although any of the qualities that are described in speaking of coloured gold may be made bright by a little variation in the mixture of alloy. The demand for articles in this gold is not at present of an extensive nature; no doubt because the finish of coloured looks more costly and beautiful. No gold inferior to 12-carat will colour to present that appearance which characterises the higher qualities. Twelve-carat gold finished bright has a fine rich sparkling appearance, and when the workmanship is good is very imposing; it is a good quality to work upon, being tolerably soft and ductile, as well as possessing good malleable properties. The quality generally manufactured is a little under the standard fineness, and therefore cannot be hall-marked. Gem, fancy, and other rings, when made at the full-standard quality, bear the government stamp as a guarantee of its purity.

Ten-carat gold sustains all the characteristics of the former quality, both as regards facility of manufacture and finish ; there are no hall-marks for this kind of gold, and it is very seldom manufactured fully up to the standard, unless specially asked for. A large quantity of goods is made of this quality in Birmingham.

Nine-carat gold is regularly manufactured into all kinds of bright goods, and this quality, when made fully up to the standard of fineness, is hall-marked. The demand for it is largely increasing. It is chiefly employed in the manufacture of keeper and fancy rings.

A good trade has recently sprung up in the manufacture of solid gold chains of this class of gold. After all, the quality which is most extensively employed in every possible description of manufacture, is usually below this standard, probably it is about 8½ carats ; and if properly alloyed will stand the aqua test perfectly well. Nine-carat of properly alloyed gold will stand more than ordinary treatment from the hands of the workman, and may be touched and removed from the annealing pan while still red hot, without injury to any subsequent manipulation of it ; it may also be quenched at any degree of heat in pickle or water, if any advantage is likely to accrue from it ; but we strongly object to the continuous quenching of gold alloys at every subsequent process of annealing—partly because every time the metal is quenched in sulphuric acid pickle a portion of alloy in these low qualities is dissolved.

This improves the quality of the gold, by which the manufacturer does not receive any benefit, but is

actually a loser.

Nine-carat alloys, if alloyed with too much spelter, will not present the characteristics we have just named in respect to treatment ; if shaken or touched while hot, they are very brittle and difficult to work ; consequently they take longer in working, and therefore the same quantity of goods cannot be produced in a given time with these alloys, as with those we have just described. The great point in the manufacture of gold articles should be to get the greatest amount of real work out of the smallest amount of material, so as to make the least possible waste or scrap for remelting ; for this reason we say that the alloys which mostly tend to this object are the best for jewellers to use in their manufactures.

Eight-carat gold is sometimes used in the manufacture of jewellery, and is often styled 9-carat, in some of the workshops where this quality is somewhat extensively employed. In order to stand the aqua test it must be alloyed with more silver than ordinary 9-carat gold, and when finished appears rather paler to the eye ; this may be a partial guide as to quality, but not always a sure one.

Seven-carat Gold is generally termed common Gold, and is about the lowest quality manufactured.

Gold chains of this quality are now very seldom made. It is mostly used by *Locket* makers in cheap work, where the backs and fronts are gold, and the edges, &c., are plated. The common alloys of gold

have a much lower fusible point than those of a superior quality.

COINING.

First of all, the gold is sent from the Bank of England to the Mint in ingots of about 180 oz. each. Every ingot is tried by the Bank assayer, and also by the Mint assayer, in order to ascertain how much each bar differs from the standard (22 carats) of absolute purity or fineness. When the proper fineness has been ascertained, and the mixture of alloy prepared (which is now always copper), the total quantity of gold and alloy, in proper proportions, is taken and divided into lots of 1,200 ozs., for the purpose of being melted into bars. The crucibles used by the master melter are about nine inches deep, by seven inches across the mouth ; and are made of graphite or plumbago. These are well heated previous to the introduction of the ingots of gold and alloy, in order to prevent cracking or flying, which, should it happen, would be serious, when so large a quantity of metal had been added. To ascertain whether a pot is cracked or not, it is well to introduce a cold bar of iron aud let it touch the bottom, when if any crack exists it will at once be visible. If the heating of the crucible has produced no ill effects, the bars of gold and alloy, which have already been prepared, are put in, and thoroughly melted, being finally well stirred with an iron stirrer ; the whole mass is then poured into ingot-moulds, sixteen being placed side by side in a frame ; the pot will hold sufficient metal to fill four ingots holding 300 ozs. each ; consequently, four pots of gold will fill the whole of the ingot-moulds.

When the ingots have become cold, either by quenching or in the ordinary way, they are stamped with certain letters or figures, and two pieces for assay are cut from each. These two pieces are sent to different assayers, the result of the test being afterwards given to the Master of the Mint, and if found correct, the master melter has properly discharged his duty.

The sizes of the bars are about 24 in. long by 1·375 broad, and about 1 in. thick. When the Master of the Mint is satisfied as to the correctness of the test, they pass into the hands of the weighers. The scales employed are so strong, and at the same time so delicate, that a single grain will give the turn, even when loaded with 1,000 ozs.

The bars of gold, when thus accurately weighed, are rolled at the rolling-mill in the manner previously described, then cut into lengths of 18 in. each, again rolled until they are 1·829 inches in width, and 0·053 in thickness, being then equal to rather less than 2in in width, and 1-19th of an inch in thickness. This process must be carried out with great care, it being very necessary that all the bars should be of the exact size. The long flat strips of gold thus made are cut up into circular blanks of the size and dimensions of sovereigns and half-sovereigns, by the cutting-out presses. At the Mint twelve of these presses are in daily operation, the mechanism of which is extremely accurate.

Some of the blanks are taken occasionally and tested as to the proper size and weight, in order to see if the cutting-out presses are properly doing their work ; and

if they are correct, the cutting-out proceeds. Subsequently, about 720 oz. of blanks are taken and put into a bag, and carried into the weighing-room, where can be witnessed at work several machines of truly marvellous beauty in construction, and of extreme accuracy. They weigh every blank separately, and even go so far as to separate the lighter or heavier coins, in a manner one would suppose the intelligence of man alone could effect—throwing those of the proper weight into one receptable, those too heavy into another, and those too light into a third. These machines are fed by a workman, whose duty it is to place a pile of gold blanks in a kind of trough made on purpose to receive them, and then leave the machines to discharge the other duties attendant upon the process; the blanks fall one by one into little slits at the bottom of the machine. There are three provided, and to determine which of the three slits shall receive the coins, the machine previously weighs it. These machines will weigh and separate about twenty-three blanks in a minute.

The sovereign, when completed and ready for circulation, is almost exactly ·868 of an inch in diameter; 1,869 sovereigns standard gold (22 carats) weigh exactly 40 lbs. troy weight; the legal weight of each can thus be very easily determined. Reduce the 40 lbs. to dwts., and divide the product by 1,869; if we then reduce the remainder to grains and again divide, we shall have the weight of 5 dwts., $3\frac{171}{623}$ grs. which is equivalent to 123·27,447 grs. the exact weight of a sovereign. It is calculated that there are in circulation in the United

Kingdom sovereigns and half-sovereigns to the value of 100,000,000 sterling.

As coins are subjected to considerable wear, through frequently passing from hand to hand, the amount of loss occasioned is worthy of some little consideration. Of course this amount will be in proportion to the length of time the coins have been in wear. To provide against this, the English Government allows a sovereign to be a legal tender till it is reduced not below 122·5 grs. (5 dwts. 2½ grs.), the difference between this and the full standard weight being the remedy allowed by English law for abrasion or loss by wear. Consequently, when English gold coins fall below this standard, they cease to be a legal tender. The depreciation of a coin depends upon its hardness, wearing much more when soft, and also upon the rapidity of its circulation. The above law, however, is not strictly carried out. The remedy for abrasion would be a little more than three-quarters of a grain for each sovereign, or decimally ·774 grains.

PRICES CHARGED FOR ASSAYING AND MARKING PLATE.

(From the Jeweller and Metal Worker Almanack.)

Gold Work.	s.	d.
Each watch case, or box	0	9
Each pendant	0	3
Each sword hilt, or watch chain	1	6
Each hook, or cane head; frame for picture; tooth-pick case; coral socket; spectacle frame; seal; medal; spoon; badge; pencil case; pap boat;	0	10
Each buckle, or piece of chain	0	5

	s.	d.
Each snuff box, or other box	1	3
Each thimble, brooch or slide; key; split ring; blade	0	6
Each pair of sleeve buttons	0	2
Each ring, coat, or breast button	0	1
Other gold work, weighing 30 oz. or under	2	6
Other gold work above 30 to 50 oz., and 30 in proportion	3	9
Least parcel of gold	1	3

Silver Work.

	s.	d.
Diet or large plate, weighing above 4lb., per lb. Troy, 10 grs.		
Shoe clasps; sleeve buttons, or studs, per doz	0	9
Each sword hilt; frame for cruets; dish stand; cock; ink stand; dish cross; argyle; bread rack	0	5
Each badge; flower frame; butter cooler; shaving pot; bottle, or lamp	0	4
Each coral socket; snuff and other boxes; pair of spurs	0	$3\frac{3}{4}$
Dozen of tea spoons; seals; buttons; salt shovels; strainers; salt ladles; or pieces to garnish cabinets, knife cases, tea chests, or bridles	0	$3\frac{3}{4}$
Each small wire basket; small pierced basket; mustard can; funnel; trowel; fish knife	0	3
Each cheese knife; pair of snuffers; canister; lancet case; table bell; or taper candlestick	0	3
Each belt buckle; lock; runner and pendant; or pieces of guns or pistols	0	$2\frac{1}{2}$
Each watch case, or box; muffineer book clasp; pen holder; crest; pickle fork; napkin ring; hinge; tea-pot handle; busk; pap boat; escallop shell; punch ladle; pierced ladle; sauce ladle; basin; bracelet; crosslet; boatswain's call; milk ewer; pepper box; bottle stand; castor; knife rests; boat; scalepan; medal	0	2
All small mugs or cups, &c., under a pint; snuffer tray; shaving brush case; scissors; trumpet; dog collar; larding pin; nipple shield; garnishes; sugar scoop; snuffer bow, or scissors ditto	0	2

	s.	d.
Each orange strainer; saltcellar; nutmeggrater; butter knife; skewer; mustard or egg spoons; pair of tea tongs; haft; small blade; fork; caddy ladle; bottle ticket; wrist band, watch pendant; cruet top; spout; seal; tongue scraper; pencil case, or single cigar tube; pair of buckles	0	1
Least parcel of silver.........	0	5

WILLIAM ROBINSON,
DEPUTY WARDEN.

HOURS.

The time for taking in work is from 9 o'clock until 9-30 a.m., except on Saturdays, when the work must be sent before 9 o'clock, a.m., to enable it to be assayed, marked, and ready for delivery before 2 o'clock p.m., when the Assay Office is closed.

THE BIRMINGHAM ASSAY OFFICE

Is open at 9 o'clock in the morning, and continues open until the work of the day is completed, on every Monday, Tuesday, Wednesday, Thursday, and Friday—except Easter Monday, the Monday in Whitsun-week, the first Monday in August, and the 26th day of December, if a week-day, during which time the office is closed. Manufacturers are required to take their work between the hours of 9 and 9-30 o'clock in the morning, and no work is received afterwards; and they are required to send for their work between the hours of 3-30 and 4 p.m., and all work not then sent for remains in the office until the following office day, at the risk of

the owner. The charges for assaying and marking gold and silver wares are:—

Gold.—For each watch chain, 1s. 6d.; for each watch case, 9d.; for each locket, 3d.; for every dozen of keeper rings (each ring made of one piece of gold) and of rings liable to duty, 9d.; for similar rings less than a dozen, each, 1d.; for other articles, each, 1d.

Silver.—For wares weighing five ounces each and upwards, ½d. per oz.; for solid table spoons, tea spoons, table forks, and fish carvers, of whatever weight, ½d. per oz.; watch cases and pendants, 1d. per oz.; wares not included in the foregoing items, 1d. per oz.—W. Westwood, Assay Master. Offices, New Hall-street.

THE SHEFFIELD ASSAY OFFICE

Is open on Mondays and Thursdays from 9 to 10 o'clock for receiving silver goods to be assayed and hall-marked. The charge for assaying and marking is —silver articles weighing less than 5 ounces each, 1d. per ounce; silver articles weighing 5 ounces each and upwards ½d. per ounce; and solid table spoons, tea spoons, table forks, pickle forks, and fish carvers, of whatever weight ½d. per ounce. For small articles weighing 10 dwts. each, or under, 6d. per dozen, but there is no charge under one shilling.—W. H. Watson and Arnold T. Watson, Assay Masters. Offices, Leopold-street.

THE CHESTER ASSAY OFFICE

Is open every day of the week, with the exception of Christmas Day, Good Friday, and the Bank Holidays. The hours are from 10 a.m. till the work received by

that time each day has been completed. The charges for watch cases are the same as those of London Hall, but for other articles they are nearly similar to those of the Birmingham office.—JAS. F. LOWE, B.A., Assay Master. Offices, Goss street.

THE NEWCASTLE ASSAY OFFICE

Is open on Tuesday and Friday morning at 9 a.m., but closed on Good Friday, Christmas Day, &c. The charges for assaying do not differ from the London prices.—JAMES ROBSON, Assay Master. Offices, Dean court, Painter Heugh, Dean street. Postal address, 27, Moseley street.

THE GLASGOW ASSAY OFFICE

Is open on Tuesdays and Fridays from 10 to 4, the only holiday being New Year's Day. The charges for hall-marking are 1d per oz. for silver, and 1s per oz. for gold.—JAMES BLACK, Assay Master. Offices, 48, Buchanan street, and 8, Prince's square.

THE EDINBURGH ASSAY OFFICE

Is open on Mondays, Wednesdays, and Fridays from 11 until 3 o'clock, and is closed on New Year's Day, and the Queen's Birthday, the only holidays. The duty on silver at this office is 1s 4d per oz.; on gold, 15s 2d per oz. For marking 15, 12, and 9-carat gold, the charge is 1/- per oz., and 1/- is charged for assaying above the marking.—ARCHIBALD POLLOCK, Assay Master. Offices, 98, South Bridge.

LIST OF DATE LETTERS

At the Goldsmith's Hall, London,

FROM 1796 TO 1886.

The year commences at this office on the 30th of May, in each year. The Hall-mark is the Leopard's head. Previous to 1822 the Hall-mark was a Leopard's head crowned.

1796-7	1797-8	1798-9	1799-0	1800-1	1801-2
A	B	C	D	E	F
1802-3	1803-4	1804-5	1805-6	1806-7	1807-8
G	H	I	K	L	M
1808-9	1809-0	1810-1	1811-2	1812-3	1813-4
N	O	P	Q	R	S
		1814-5	1815-6		
		T	U		
1816-7	1817-8	1818-9	1819-0	1820-1	1821-2
a	b	c	d	e	f
1822-3	1823-4	1824-5	1825-6	1826-7	1827-8
g	h	i	k	l	m
1828-9	1829-0	1830-1	1831-2	1832-3	1833-4
n	o	p	q	r	s
		1834-5	1835-6		
		t	u		

1836-7	1837-8	1838-9	1839-0	1840-1	1841-2
A	B	C	D	E	F

1842-3	1843-4	1844-5	1845-6	1846-7	1847-8
G	H	I	K	L	M

1848-9	1849-0	1850-1	1851-2	1852-3	1853-4
N	O	P	Q	R	S

1854-5	1855-6
T	U

The above letters are not exact, but are as near as could be got; the main difference is the absence of the hair-lines in the originals.

1856-7	1857-8	1858-9	1859-0	1860-1	1861-2
a	b	c	d	e	f

1862-3	1863-4	1864-5	1865-6	1866-7	1867-8
g	h	i	k	l	m

1868-9	1869-0	1870-1	1871-2	1872-3	1873-4
n	o	p	q	r	s

1874-5	1875-6
t	u

1876-7	1877-8	1878-9	1879-0	1880-1	1881-2
A	**B**	**C**	**D**	**E**	**F**
1882-3	1883-4	1884-5	1885-6		
G	**H**	**I**	**K**		

LIST OF DATE LETTERS

At the Chester Assay Office,

FROM AUG. 5, 1797 TO 1884.

The Hall-mark is a dagger between three wheat sheaves.

1797-8	1798-9	1799-0	1800-1	1801-2	1802-3
A	B	C	D	E	F
1803-4	1804-5	1805-6	1806-7	1807-8	1808-9
G	H	I	K	L	M
1809-0	1810-1	1811-2	1812-3	1813-4	1814-5
N	O	P	Q	R	S
1815-6	1816-7	1817-8			
T	U	V			
1818-9	1819-0	1820-1	1821-2	1822-3	1823-4
A	B	C	D	E	F
1824-5	1825-6	1826-7	1827-8	1828-9	1829-0
G	H	I	K	L	M
1830-1	1831-2	1832-3	1833-4	1834-5	1835-6
N	O	P	Q	R	S
1836-7	1837-8	1838-9			
T	U	V			

1839-0	1840-1	1841-2	1842-3	1843-4	1844-5
A	B	C	D	E	F
1845-6	1846-7	1847-8	1848-9	1849-0	1850-1
G	H	I	K	L	M
1851-2	1852-3	1853-4	1854-5	1855-6	1856-7
N	O	P	Q	R	S
1857-8	1858-9	1859-0	1860-1	1861-2	1862-3
T	U	V	W	X	Y
		1863-4			
		Z			
1864-5	1865-6	1866-7	1867-8	1868-9	1869-0
a	b	c	d	e	f
1870-1	1871-2	1872-3	1873-4	1874-5	1875-6
g	h	i	k	l	m
1876-7	1877-8	1878-9	1879-0	1880-1	1881-2
n	o	p	q	r	s
		1882-3	1883-4		
		t	u		

LIST OF DATE LETTERS

At the Assay Office, Birmingham,

FROM JUNE 24, 1799 TO 1889.

The Hall-mark at this Office is an anchor.

1799-0	1800-1	1801-2	1802-3	1803-4	1804-5
a	b	c	d	e	f

1805-6	1806-7	1807-8	1808-9	1809-0	1810-1
g	h	i	j	k	l
1811-2	1812-3	1813-4	1814-5	1815-6	1816-7
m	n	o	p	q	r
1817-8	1818-9	1819-0	1820-1	1821-2	1822-3
s	t	u	v	w	x
		1823-4	1824-5		
		y	z		
1825-6	1826-7	1827-8	1828-9	1829-0	1830-1
𝕬	𝕭	𝕮	𝕯	𝕰	𝕱
1831-2	1832-3	1833-4	1834-5	1835-6	1836-7
𝕲	𝕳	𝕴	𝕶	𝕷	𝕸
1837-8	1838-9	1839-0	1840-1	1841-2	1842-3
𝕹	𝕺	𝕻	𝕼	𝕽	𝕾
1843-4	1844-5	1845-6	1846-7	1847-8	1848-9
𝕿	𝖀	𝖁	𝖂	𝖃	𝖄
		1849-0			
		𝖅			
1850-1	1851-2	1852-3	1853-4	1854-5	1855-6
A	B	C	D	E	F
1856-7	1857-8	1858-9	1859-0	1860-1	1861-2
G	H	I	K	L	M
1862-3	1863-4	1864-5	1865-6	1866-7	1867-8
N	O	P	Q	R	S
1868-9	1869-0	1870-1	1871-2	1872-3	1873-4
T	U	V	W	X	Y
		1874-5			
		Z			

1875-6	1876-7	1877-8	1878-9	1879-0	1880-1
a	b	c	d	e	f
1881-2	1882-3	1883-4	1884-5	1885-6	1886-7
g	h	i	k	l	m
		1887-8	1888-9		
		n	o		

LIST OF DATE LETTERS

At the Assay Office, Sheffield.

FROM JUNE 24, 1824 TO 1884.

The Hall-mark at this Office is a crown. Only silver goods are assayed here.

1824-5	1825-6	1826-7	1827-8	1828-9	1829-0
a	b	c	d	e	f
1830-1	1831-2	1832-3	1833-4	1834-5	1835-6
g	h	k	l	m	p
1836-7	1837-8	1838-9	1839-0	1840-1	1841-2
q	r	s	t	u	v
		1842-3	1843-4		
		X	Z		
1844-5	1845-6	1846-7	1847-8	1848-9	1849-0
A	B	C	D	E	F
1850-1	1851-2	1852-3	1853-4	1854-5	1855-6
G	H	I	K	L	M

1856-7	1857-8	1858-9	1859-0	1860-1	1861-2
N	O	P	R	S	T
1862-3	1863-4	1864-5	1865-6	1866-7	1867-8
U	V	W	X	Y	Z
1868-9	1869-0	1870-1	1871-2	1872-3	1873-4
A	B	C	D	E	F
1874-5	1875-6	1876-7	1877-8	1878-9	1879-0
G	H	J	K	L	M
	1880-1	1881-2	1882-3	1883-4	
	N	O	P	Q	

LIST OF DATE LETTERS

At the Assay Office, Newcastle-on-Tyne,

FROM MAY 3, 1800 TO 1888.

The Hall-mark at this Office, is three castles.

1800-1	1801-2	1802-3	1803-4	1804-5	1805-6
K	L	M	N	O	P
1806-7	1807-8	1808-9	1809-0	1810-1	1811-2
Q	R	S	T	U	W
	1812-3	1813-4	1814-5		
	X	Y	Z		
1815-6	1816-7	1817-8	1818-9	1819-0	1820-1
A	B	C	D	E	F
1821-2	1822-3	1823-4	1824-5	1825-6	1826-7
G	H	I	K	L	M
1827-8	1828-9	1829-0	1830-1	1831-2	1832-3
N	O	P	Q	R	S

1833-4	1834-5	1835-6	1836-7	1837-8	1838-9
T	U	W	X	Y	Z
1839-0	1840-1	1841-2	1842-3	1843-4	1844-5
A	B	C	D	E	F
1845-6	1846-7	1847-8	1848-9	1849-0	1850-1
G	H	I	J	K	L
1851-2	1852-3	1853 4	1854-5	1855-6	1856-7
M	N	O	P	Q	R
1857-8	1858-9	1859-0	1860-1	1861-2	1862-3
S	T	U	W	X	Y
		1863-4			
		Z			
1864-5	1865-6	1866-7	1867-8	1868-9	1869-0
a	b	c	d	e	f
1870-1	1871-2	1872-3	1873-4	1874-5	1875-6
g	h	i	k	l	m
1876-7	1877-8	1878-9	1879-0	1880-1	1881-2
n	o	p	q	r	s
1882-3	1883-4	1884-5	1885-6	1886-7	1887-8
t	u	w	x	y	z

LIST OF DATE LETTERS

At the Exeter Assay Office,

FROM AUGUST, 1817 TO 1877.

The Hall-mark at this Office was a castle with three towers.
This Office has now become extinct.

1817-8	1818-9	1819-0	1820-1	1821-2	1822-3
a	b	c	d	e	f

1823-4 g	1824-5 h	1825-6 i	1826-7 k	1827-8 l	1828-9 m
1829-0 n	1830-1 o	1831-2 p	1832-3 q	1833-4 r	1834-5 s
		1835-6 t	1836-7 u		
1837-8 𝕬	1838-9 𝕭	1839-0 𝕮	1840-1 𝕯	1841-2 𝕰	1842-3 𝕱
1843-4 𝕲	1844-5 𝕳	1845-6 𝕴	1846-7 𝕶	1847-8 𝕷	1848–9 𝕸
1849-0 𝕹	1850-1 𝕺	1851-2 𝕻	1852-3 𝕼	1853-4 𝕽	1854-5 𝕾
		1855-6 𝕿	1856-7 𝖀		
1857-8 A	1858-9 B	1859-0 C	1860-1 D	1861-2 E	1862-3 F
1863-4 G	1864-5 H	1865-6 I	1866-7 K	1867-8 L	1868-9 M
1869-0 N	1870-1 O	1871-2 P	1872-3 Q	1873-4 R	1874-5 S
		1875-6 T	1876-7 U		

LIST OF DATE LETTERS

At York Office,

FROM 1812 TO 1857.

The Hall-mark at this Office was five lions on a cross, the leopard's head being also impressed as an additional mark.
This Assay Office has now become extinct.

1812-3	1813-4	1814-5	1815-6	1816-7	1817-8
a	b	c	d	e	f
1818-9	1819-0	1820-1	1821-2	1822-3	1823-4
g	h	i	k	l	m
1824-5	1825-6	1826-7	1827-8	1828-9	1829-0
n	o	p	q	r	s
1830-1	1831-2	1832-3	1833-4	1834-5	1835-6
t	u	v	w	x	y
		1836-7			
		z			
1837-8	1838-9	1839-0	1840-1	1841-2	1842-3
A	B	C	D	E	F
1843-4	1844-5	1845-6	1846-7	1847-8	1848-9
G	H	I	K	L	M
1849-0	1850-1	1851-2	1852-3	1853-4	1854-5
N	O	P	Q	R	S
		1855-6	1856-7		
		T	U		

LIST OF DATE LETTERS

At the Assay Office, Edinburgh,

FROM OCT. 1806, TO 1882.

The Hall-mark at this Office is a castle.

1806-7	1807-8	1808-9	1809-0	1810-1	1811-2
a	b	c	d	e	f
1812-3	1813-4	1814-5	1815-6	1816-7	1817-8
g	h	i	j	k	l
1818-9	1819-0	1820-1	1821-2	1822-3	1823-4
m	n	o	p	q	r
1824-5	1825-6	1826-7	1827-8	1828-9	1829-0
s	t	u	v	w	x
		1830-1	1831-2		
		y	z		
1832-3	1833-4	1834-5	1835-6	1836-7	1837-8
A	B	C	D	E	F
1838-9	1839-0	1840-1	1841-2	1842-3	1843-4
G	H	I	K	L	M
1844-5	1845-6	1846-7	1847-8	1848-9	1849-0
N	O	P	Q	R	S
1850-1	1851-2	1852-3	1853-4	1854-5	1855-6
T	U	V	W	X	Y

1856-7

Z

1857-8	1858-9	1859-0	1860-1	1861-2	1862-3
A	**B**	**C**	**D**	**E**	**F**
1863-4	1864-5	1865-6	1866-7	1867-8	1868-9
G	**H**	**I**	**K**	**L**	**M**
1869-0	1870-1	1871-2	1872-3	1873-4	1874-5
N	**O**	**P**	**Q**	**R**	**S**
1875-6	1876-7	1877-8	1878-9	1879-0	1880-1
T	**U**	**V**	**W**	**X**	**Y**
		1881-2			
		Z			

LIST OF DATE LETTERS

At the Assay Office, Glasgow,

FROM JUNE 24, 1819 TO 1889.

The Hall-mark at this Office is a tree, fish and bell.

1819-0	1820-1	1821-2	1822-3	1823-4	1824-5
A	B	C	D	E	F
1825-6	1826-7	1827-8	1828-9	1829-0	1830-1
G	H	I	J	K	L
1831-2	1832-3	1833-4	1834-5	1835-6	1836-7
M	N	O	P	Q	R
1837-8	1838-9	1839-0	1840-1	1841-2	1842-3
S	T	U	V	W	X
		1843-4	1844-5		
		Y	Z		

1845-6	1846-7	1847-8	1848-9	1849-0	1850-1
A	B	C	D	E	F
1851-2	1852-3	1853-4	1854-5	1855-6	1856-7
G	H	I	J	K	L
1857-8	1858-9	1859-0	1860-1	1861-2	1862-3
M	N	O	P	Q	R
1863-4	1864-5	1865-6	1866-7	1867-8	1868-9
S	T	U	V	W	X
		1869-0	1870-1		
		Y	Z		
1871-2	1872-3	1873-4	1874-5	1875-6	1876-7
A	B	C	D	E	F
1877-8	1878-9	1879-0	1880-1	1881-2	1882-3
G	H	I	J	K	L
1883-4	1884-5	1885-6	1886-7	1887-8	1888-9
M	N	O	P	Q	R

LIST OF DATE LETTERS

At the Assay Office, Dublin,

FROM MAY 1821, TO 1885.

The Hall-mark at this Office is the figure of Hibernia.

1821-2	1822-3	1823-4	1824-5	1825-6	1826-7
A	B	C	D	e E	F
1827-8	1828-9	1829-0	1830-1	1831-2	1832-3
G	H	I	K	L	M
1833-4	1834-5	1835-6	1836-7	1837-8	1838-9
N	O	P	Q	R	S

1839-0	1840-1	1841-2	1842-3	1843-4	1844-5
T	U	V	W	X	Y
		1845-6			
		Z			
1846-7	1847-8	1848-9	1849-0	1850-1	1851-2
a	b	c	d	e	f
1852-3	1853-4	1854-5	1855-6	1856-7	1857-8
g	h	j	k	l	m
1858-9	1859-0	1860-1	1861-2	1862-3	1863-4
n	o	P	Q	r	s
1864-5	1865-6	1866-7	1867-8	1868-9	1869-0
t	u	v	w	x	Y
			1870-1		
			z		
1871-2	1872-3	1873-4	1874-5	1875-6	1876-7
A	B	C	D	E	F
1877-8	1878-9	1879-0	1880-1	1881-2	1882-3
G	H	I	K	L	M
		1883-4	1884-5		
		N	O		

ITEMS WORTH KNOWING

RELATING TO THE JEWELLERY TRADE.

Watch Guards, Alberts, and Cases are exempt from duty.

Duty on Gold is 17/- per oz.; Silver, 1/6 per oz., troy. Watch Case Makers do not require license to sell the same. No licences are required to sell Gold articles which do not exceed two pennyweights, nor Silver articles which do not exceed four pennyweights, nor for Lace, Wire, Thread, or Fringe of any kind or weight. Hall-marked Silver is the same quality as coin. 22 carat articles are equal to Gold coin. It is compulsory that all duty-paying articles shall be Hall-marked; also watch cases. The term carat is not an absolutely fixed or real weight for Gold, but denotes the quality; when speaking of Diamonds it is a real weight, 151½ make one English ounce, but it is not the same in all countries. There are about 78 million Silver coins in circulation. Yearly loss of silver from all sources, about 1½ million ounces. Gold coins in circulation, about 68 million. Total loss of gold from all sources in the world, about 15 tons.

Standard mark, in France, for Gold—Head of a Greek Physician. Hall-mark—Head of an Eagle, or Head of a Horse. Hall-mark for Silver—The Head of a Wild Boar, or a Crab.

15 carat articles are marked as follows :—

1.—G. J. ... ... The Initials of the Maker.
2.—15·625 ... ... The Standard Mark.
3.—Leopard's Head ... The Hall-Mark.
4.—H. ... The Date Letter for 1883-4.

12 Carat Articles—

1.—G- J. ... The Initials of the Maker.
2.—12·5 ... The Standard Mark.
3.—Leopard's Head ... The Hall-Mark.
4.—H. ... The Date Letter for 1883-4.

9 Carat Articles—

1.—G. J. ... ... The Initials of the Maker.
2.—9·375 ... ... The Standard Mark.
3.—Leopard's Head ... The Hall-Mark.
4.—H. ... The Date Letter for 1883-4

Old Standard Silver, is marked as follows—

1.—G. J. ... The Initials of the Maker.
2.—Lion Passant ... The Standard Mark.
3.—Leopard's Head ... The Hall-Mark.
4.—H. ... The Date Letter for 1183-4.
5.—Queen's Head...Denotes Payment of Duty.

The above examples of Hall-marking apply alike to all the offices in England, each office using its own respective Date Letter and Hall-Mark.

EDINBURGH :

1.—G. J. ... The Initials of the Maker.
2.—22 ... ... The Quality 22 carats.
3.—Thistle ... The Standard Mark.
4.—Castle ... ... The Hall-Mark.
5.—A ... The Date Letter for 1883-4.
6.—Queen's Head Denotes payment of Duty.

There are also 6 similar marks for 18 carat articles subject to duty, with the exception of the quality mark which of course is 18.

22 and 18 carat articles not subject to duty are marked with the above-named first and five marks.

15 carat articles—

1.—G. J. ... The Initials of the Maker.
2.—15 ... ... The Quality Mark
3.—Castle ... ... The Hall Mark
4.—A. ... The Date Letter for 1882-3.

12 Carat Articles—

1.—G. J. ... The Initials of the Maker.
2.—12 ... ... The Quality Mark.
3.—Castle ... ... The Hall Mark.
4.—A. ... The Date Letter for 1882-3.

9 Carat Articles—

1.—G. J. ... The Initials of the Maker.
2.—9 ... ... The Quality Mark.
3.—Castle ... ... The Hall Mark.
4.—A. ... The Date Letter for 1882-3.

At this Office the above marks apply also to silver articles, omitting the quality mark.

GLASGOW :

1.—G. J. ... The Initials of the Maker.
2.—22 ... ... The Quality Mark.
3.—Lion Rampant ... The Standard Mark.
4.—Tree, Fish, and Bell ... The Hall Mark.
5.—M. ... The Date Letter for 1883-4.
6.—Queen's Head...Denotes payment of duty.

At this office 18 carat articles subject to duty are marked as above, except the quality Mark.

22 and 18 carat articles not subject to duty, are marked with the above named first 5 marks.

15 Carat Articles—

1.—G. J. ... The Initials of the Maker.
2.—15 ... ... The Quality Mark.
3.—Lion Rampant ... The Standard Mark.
4.—Tree, Fish, and Bell ... The Hall-Mark.
5.—M. ... The Date Letter for 1883-4.

At this office silver is marked same as gold, quality mark omitted.

12 and 9 carat articles are marked just the same, except the quality mark, which are 12 and 9 respectively.

DUBLIN:

22 Carat Articles—

1.—G. J. ... The Initials of the Maker.
2.—22 ... ... The Quality Mark.
3.—Harp, crowned ... The Standard Mark.
4.—Hibernia ... ... The Hall-Mark.
5.—N. ... ... The Date Letter for 1883-4.
6.—Queen's Head...Denotes payment of Duty.

20 Carat Articles—

1.—G. J. ... The Initials of the Maker.
2.—20 ... ... The Quality Mark.
3.—Plume of Feathers ... The Standard Mark.
4.—Hibernia ... ... The Hall-Mark.
5.—N. ... The Date Letter for 1883-4.
6.—Queen's Head...Denotes payment of Duty.

18 Carat Articles

1.—G. J. ... The Initials of the Maker.
2.—18 ... ... The Quality Mark.

3.—Unicorn's Head ... The Standard Mark.
4.—Hibernia ... ... The Hall-Mark.
5.—N. ... The Date Letter for 1883-4.

15 Carat Articles

1.—G. J. ... The Initials of the Maker.
2.—15.625...The Quality and Standard Marks.
3.—Hibernia ... ... The Hall-Mark.
4.—N. ... The Date Letter for 1883-4.

12 Carat Articles—

1.—G. J. ... The Initials of the Maker.
2.—12.5 ... The Quality and Standard Marks.
3.—Hibernia ... ... The Hall-Mark.
4.—N. ... The Date Letter for 1883-4.

9 Carat Articles

1.—G. J. ... The Initials of the Maker.
2.—9.375 ... The Quality and Standard Marks.
3.—Hibernia ... ... The Hall-Mark.
4.—N. ... The Date Letter for 1883-4.

OLD STANDARD SILVER.

DUBLIN :

Silver articles at this office, like Edingburgh and Glasgow, are marked same as gold, viz :

1.—G. J. ... The Initials of the Maker.
2.—Harp, crowned ... The Standard Mark.
3.—Hibernia ... ... The Hall-Mark.
4.—N. ... The Date Letter for 1883-4.
5.—Queen's Head...Denotes payment of Duty.

It must be borne in mind that there are only a very few articles comparatively which pay duty, and the same is paid at the Assay Office before the goods are taken away, and if they are afterwards exported, a drawback is allowed. The duty money is handed over to the Government, but the charges for stamping, &c., belong to the office for wages, &c.

STANDARDS OF GOLD & SILVER

In different Countries of the World.

In the following table 1000 stands for pure gold or silver.

COUNTRIES.	GOLD WARE.				SILVER WARE.		REMARKS.
Alsace & Lorraine	920	840	750		950	800	[export only.
France	920	840	750		950	800	Lower than this is for
Austria	920	840	750	580	950	900	The Hall-Mk, Imper-
,,					800	750	ial Eagle, 2 necks
Geneva	750				800		Not Compulsory.
Basle	750				$787\frac{1}{4}$		
China	1000						Pure Gold.
Denmark	750						No Special Laws.
Belgium	800	750			900	800	Not Compulsory.
Holland	916	833	750	583	934	800	Not Compulsory.
Egypt	750				900		
Turkey	750				900		
United States	750	583	416				No Special Laws.
Italy	900	750	500		950	900	
,,						800	
Spain	$916\frac{2}{3}$	$853\frac{1}{3}$	750		$916\frac{2}{3}$	750	
Neufchatel	750	583			800		Not Compulsory
Russia	850	750	$583\frac{1}{3}$		948		
Pays de Vaude	750				800		Not Compulsory
Sweden	976	$847\frac{2}{9}$	$763\frac{2}{9}$		$826\frac{7}{8}$		
Norway	750	$583\frac{1}{3}$			$826\frac{1}{2}$		
Persia	$758\frac{1}{3}$	125					No Special Laws.
Japan	$958\frac{1}{2}$	750					

Great Britain ... 9 .. 12 ... 15 ... 18 ... 20 ... 22 & 24 carats gold, 959 & 925 Silver.

In nearly all the Countries of the world the Standards are expressed in 1000ths; See the following table, which gives also the highest mint-prices per ounce of Gold.

				£	s	d
$\frac{41\frac{2}{3}}{1000}$	Equal	1	Carat	0	3	$6\frac{1}{2}$
$\frac{125}{1000}$	,,	3	,, ...	0	10	$7\frac{1}{2}$
$\frac{250}{1000}$	,,	6	,, ...	1	1	$2\frac{1}{4}$
$\frac{375}{1000}$	,,	9	,, ...	1	11	$10\frac{1}{2}$
$\frac{416\frac{2}{3}}{1000}$	,,	10	,, ...	1	15	$4\frac{3}{4}$
$\frac{500}{1000}$	,,	12	,, ...	2	2	$5\frac{3}{4}$
$\frac{583\frac{1}{3}}{1000}$	,,	14	,, ...	2	9	$6\frac{3}{4}$
$\frac{625}{1000}$	,,	15	,, ...	2	13	1
$\frac{750}{1000}$	,,	18	,, ...	3	3	$8\frac{1}{2}$
$\frac{833\frac{1}{3}}{1000}$	,,	20	,, ...	3	10	$9\frac{1}{2}$
$\frac{916\frac{2}{3}}{1000}$	,,	22	,, ...	3	17	$10\frac{1}{2}$
$\frac{958\frac{1}{3}}{1000}$	,,	23	,, ...	4	1	5
$\frac{1000}{1000}$	,,	24	,, ...	4	4	$11\frac{1}{2}$

INDEX.

By kind permission of Mr E. W. Streeter, F.R.G.S., of Bond Street, London, I have copied the matter from Page 31 to 52, with the exception of most of pages 33 & 34 and the tables at page 44 & 45, from his valuable and well known copywright work, "Precious Stones and Gems."

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